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BY RAYMOND F. JONES

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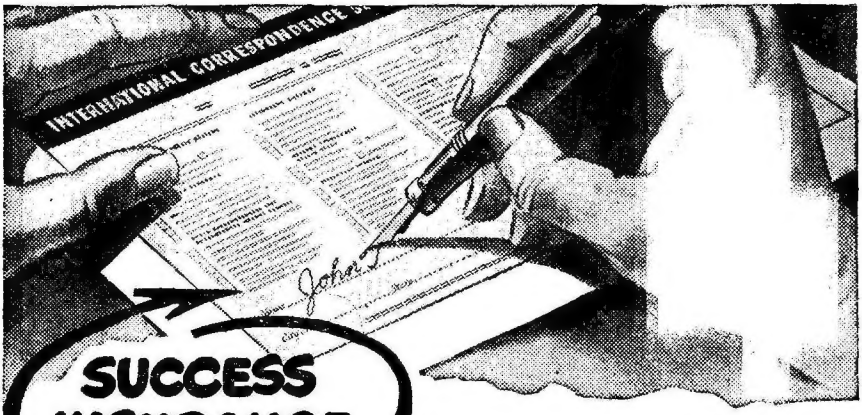

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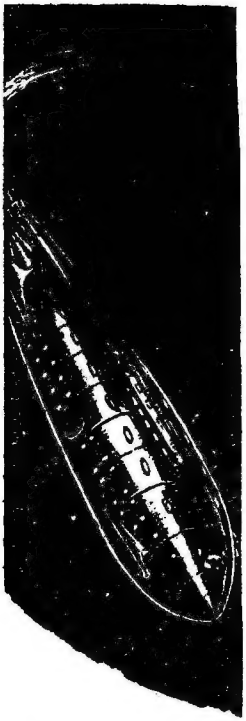

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"There Ain't No Sich Animile!"

Man and his efforts to produce devices for his convenience keep demanding things that don't exist, the combination of properties that are mutually exclusive, and—sooner or later—getting what's wanted.

Plastics have become immensely important largely because of the fact that that broad term includes such an immense number of possibilities, such a diversity of compounds, that almost any chemical substance not intended as a food or drug, and not an element, can be claimed as his own by the plastics chemist. As a matter of fact, they've even claimed—with some reason—one of the elements. There's a plastic form of sulphur that, if it could be stabilized, would have some handy uses. The metallurgists won't let them claim the metals, but almost anything else goes.

Usually, the plastics chemists stick fairly close to five elements—carbon, hydrogen, oxygen, nitrogen and chlorine. That's not a very harsh limitation; those five together form immensely more compounds than all other elements totaled. They form so many compounds that, by mixing some of the compounds for added diversity, the plastics men have definitely made things that don't exist, and combined obviously mutually exclusive properties.

There's the cockeyed sort of elasticity that makes nylon *the* material for glider towropes. It's slow-rubber. When the terrific yank of the fast moving towing plane jerks the glider into motion, at the take-off, the nylon rope absorbs the shock by stretching like a rubber band. Once the glider has been picked up, and is in full motion, a rubber band would snap back—and slap the glider against the tail of the tow-plane. Nylon doesn't; it's perfectly elastic, and returns to its original length—but does it gradually.

But there are the elastomers such as Buna S and the like that are perfect equivalents to the natural elastomer, rubber. They snap back, of course. Incidentally, it's a fairly good bet that the synthetic elastomers will shortly make tires which will withstand high-speed driving as long as or longer than the natural rubber tires. Those who were buying automobile tires about 1920 may remember that a tire that stood up for five thousand miles was a darned good shoe. And that was not under high-speed driving, either; the cars weren't capable of real speed. Since then, an enormous list of adulterants, additives, oxidation retardants, compounding agents, and whatnots have been developed; a "natural rubber" tire was a long, long way from being rubber—and was good for at least thirty thousand miles, even with hard driving.

Synthetic replacements are handicapped by the fact that—quite understandably—the various additives that made rubber wear don't work in exactly the same way for the new compounds. Carbon black, very fine particles of amorphous carbon, greatly improved natural rubber; it just happens that it isn't the best additive with the synthetics. It now appears that copper compounds—poison to rubber—are extremely helpful with the synthetics.

It may be that there is no such substance as the perfect additive to synthetic rubber. Maybe so. That's of no long-term importance; they'll create one sooner or later. After all, a rubber tree wasn't trying to make the perfect automobile tire; the plastics chemist is. It would be very strange indeed if the tree had accidentally hit on the one and only perfect elastomer for tires.

THE EDITOR.

Renaissance

by RAYMOND F. JONES

***First** of a three-part serial of a great plan and two worlds—and an accident of Nature the Plan had not allowed for, an accident that made birth impossible in the new world, and so distorted all science—*

Illustrated by Orban

The first globe had set, and the lengthening shadows cast by the second sun were darkening the great hall of the *Karildex*.

The mighty machine seemed crouched down in the half darkness, like some mammoth creature settling for the night. The purple sheen of its thousand metallic facets reflected the glowing firebursts that lit the sky from Fire Land.

Only one position of the machine was occupied. It was being used by an inconspicuous, middle-aged man who punched one key after

another in laborious indecision.

Twice, Ketan had offered to help him, and each time had been shrugged away. Would the fool never leave?

Ketan glanced at the other end of the hall where a single immobile figure was outlined against the twilight streaming through the broad, colored window.

Branen had been patient, but Ketan was anxious to carry out the purpose of their meeting. He sat down at his technician's position and turned to the filing of some of the day's new matrices.

These were the square perforated transparencies by which the master integration of the *Karildex* was formed. Each citizen of Kronweld, if he so chose, had the right to keep on file a matrix which integrated his characteristics, desires, wants, wishes, and passions with the thousands of others in the city.

The complete integration of the factors on the thousands of matrices formed an integrated will—the will, the law of Kronweld. The result could be read on the indicators and charts as if the entire city were a single individual.

The *Karildex* was thus the law and the government, requiring only administration. Any citizen desiring to know the concurrency of a contemplated act simply prepared a prospective integration on the keyboard and took an indication of congruency with the standard will of Kronweld. Lawbreaking was obviated before it could be initiated.

This was what the lone inquirer of the *Karildex* was doing as Ketan

chafed at his technician's position, irritably filing the revised matrices which had been submitted that day.

After three mistakes he gave up. He stood watching at the side of the towering machine, shifting his weight from foot to foot. He ran his lean, strong fingers through his black locks and thought of Elta whom he must meet within a short time—and of Daran. His lean jaw set hard as he thought of the coming encounter with the great Teacher.

Abruptly, the position light at the distant keyboard snapped out. The intruding presence of the trifling inquirer disappeared slowly through the broad doors of the building. Only the glow of dim night lamps far up against the ceiling and low green lamps outlining the *Karildex* remained to illumine the hall. The suns had set, leaving the purple, weaving glow from Fire Land to dominate the sky.

Ketan whipped into action. The figure at the other end of the hall approached. Ketan hurried to meet him.

"What did you find out, Branen?" he asked quickly.

"Nothing. I set keys all day until the tips of my fingers are worn down. Anything involving the question of the Temple of Birth has an index of above a hundred. Absolutely forbidden. The index is rising constantly. I'll bet those new matrices you filed today put it up another tenth of a point. It's hopeless to try to oppose it."

"I know the index," Ketan snapped impatiently. "But it's not hopeless. We're going to carry it through. Come here, and let me show you why I asked you to come."

He led the way quickly past the machine into a half hidden alcove. There lay the master control board to which only members of the First Group had access. Its multiple tiers of keys in semicircular banks rose to the limit of a long arm reach. At the top of the banked keys the indicator faces arced over in a ceiling formation that made a shell-like inclosure of the intricate keyboard. Only after long *tara* of experience did a man become proficient in its use.

Branen uttered a gasp as Ketan led him forward. "You've broken the seal on the master control board!"

"Never mind. Come here and look," Ketan urged. He sat before the ten thousand keys of the position and began manipulating an intricate formation.

"I did all that this afternoon," Branen observed impatiently. "The index—"

"The index is a hundred and ninety. That indicates that investigation into the origin of human life is absolutely forbidden. Now let's try this one."

Ketan reset the keys. "There's merely the question of life itself. The index is the same. That shows that the integration of life makes no distinction between life and human life. The factor is identical. Now watch when we change the factor to plants and animals."

Breathlessly, Branen watched.

This was a line of reasoning that he had not followed. He waited for the index to appear on the indicator.

"Ninety," he breathed, "why, that—"

"Remember, now, we still have the factor of the Temple of Birth present in the master integration. Now, suppose we remove it."

"You can't. That's an impossibility."

"What do you think this master control board is for? Why do you suppose the First Group keeps it sealed?"

"But you will destroy the integration. The factor strengths are on record. When it is discovered that they have been changed—"

"They'll not change. I am setting up a separate memory circuit which holds all factors controlled by the concept of the Temple of Birth in abeyance. Read your index!"

One by one, Branen read them off as Ketan set up the factors minus the concept of the Temple of Birth. "Twenty-five, sixteen, nine!" he exclaimed. "We could investigate."

"*If* this integration represented the actual status of things," Ketan said. He reset the disturbed factors and returned the keyboard to normal. He replaced its intricate seal so that his intrusion would never be known. Then he led Branen away, back to the main hall.

"I asked you here tonight," Ketan said slowly, "to show you this, and to instruct you to take my place with the Unregistereds—if anything happens to me."

"Why should anything happen to you? You aren't—?" Branen began.

"I think the time has come to test our strentgh. Unless we make some positive forward move quickly the Unregistereds will die out and our purpose be lost."

"But you are the only one that is impatient," Branen protested. "The other members of the Unregistereds are content to wait until the situation becomes more promising."

"Becomes more promising! It will never become more promising until we make it so!" Ketan's fist smashed down against a position panel on the *Karildex*. His eyes shifted their focus and stared off into the far distance where darkness hid the other end of the machine.

"Imagine it," he murmured, "superstition, false knowledge, mental degeneracy—becoming so great that nine tenths of the problems we would investigate now are forbidden to us because the people of Kronweld believe they are reserved for the God. Those of us who refuse to register our Seeking with the Seekers Council must work in darkness in secret shops and hide as if we were declassed.

"We would be—if we were discovered."

Ketan whirled upon his companion impatiently. "Branen, this is what I am trying to say: The time has come for the Unregistereds to come out of their holes, their

hidden laboratories, and assert their rights to Seek into any Mystery whose existence is obvious—the Mystery of the Temple of Birth, the Mystery of the great Edge, the Mystery of Fire Land. These things should not be closed to us. We should not have to go and make application to a bunch of whiskery old men and desiccated old women in order to Seek into a Mystery. The only right they have to restrict our Seeking is based upon false integrations of the *Karildex*.

"That means the time has come to eradicate those false integrations. The time has come to bare to all Kronweld the work that we have been doing."

"We wouldn't dare!" Branen gasped.

"No—*we* wouldn't dare," Ketan said bitterly. "*We* wouldn't—meaning most of the Unregistereds. But *I* would. I'm going to take the chance. I'm going to tell the Seekers Council—at a public hearing—that I've found the secret of the creation of life."

"They'll declass you!"

"Let them—if they dare, after what I have to show them."

Branen gazed in silent admiration upon the tall, rangey form of his leader. He gazed into the snapping eyes and the long, lean jaw that clenched firm, admitting of no uncertitude, once a course of action had been set.

He shook his head sadly. "I could never take your place. You are so *sure*. You seem to know without a doubt where you're going. You say that five hundred *tara* of tradition in Kronweld can be overthrown in a day and state it as easily as if you were going to order a meal from a panel. I must be honest with you. Not one of the Unregistereds believes you can succeed in your defiance of the ways of Kronweld—though you almost convince me."

"And that is why you are the only one to whom I can offer my place in case something happens to me. There is danger enough. I am not minimizing it. I know it's tampering with the most explosive force in Kronweld to attack the Temple of Birth. But it must be destroyed. Every shred of its influence must be wiped out of our lives. Unless it's done our civilization is doomed. I'm going to make a start. If I fail, you will carry on the work of the Unregistereds—until the situation becomes more promising. You agree?"

"I'll do it," Branen whispered solemnly. "I'll do it." Then, "What is your plan?" he asked.

"Teacher Daran has asked me to come to see him tonight. I'll provoke him into ordering a reprimand for me. That will provide an opportunity for a full public hearing which I shall demand."

"It won't be hard to provoke Teacher Daran. He's been on the verge of ordering your reprimand almost from the first time he saw you."

"I know. If I fail, you will find all my notes and materials in my hidden laboratory beneath the house. You know where they are. Take them and use them. Carry the

work on from there. That is all."

A momentary uncertainty crossed Branen's face, and then he turned and was gone.

II.

Ketan moved towards the lights and door controls. He walked in weariness after the tension of coming to a decision was over. He felt as if he were flowing on the breast of a river of destiny. Nothing could turn him aside, now.

He was glad the day was over. He never knew how long a day might be, because the machine was at the service of the people of Kronweld as long as there were any who still desired to use it. As senior technician, it was Ketan's duty to remain until the last inquirer had been satisfied.

But there would be no more tonight. He flicked off the light and hurried along towards the dimly luminous panel of the door. The great machine with its store of the mind and feelings of Kronweld lay silent and asleep like a great living beast.

Ketan knew he was already late for his appointment with Elta. She would be angry and her eyes, like the tips of hot, blue flames would be scathing—for a short time. It was hard for either of them to hold the peak of anger long between them before they found themselves laughing at their baseless arguments.

As he stepped out, the cool night wind brushed his face in relaxing freshness. His heartbeat increased and the day's weariness began to pass with the thought of Elta.

It was then that he saw the old woman.

She was alone, hobbling along the walk that led from the distant street to the steps of the hall of the *Karildex*. As she shuffled forward, Ketan stood entranced by the wave of near hypnotic attention the withered figure demanded.

She was like the dried leaves that scurried across the lawn in front of the building. Her hair was awry and swaying like living tentacles in the night. And the black shawl, that was characteristic of the old when their bodies became too ill-formed for the revealing harness of ordinary wear, was like a shroud about her.

She croaked a single word at him and pointed a gnarled finger. "Wait!"

It was no request. It was a command.

"The building has just been closed for the night. It is too late to make any inquiry tonight." Ketan's vocie carried little conviction.

"Don't tell me any of that! I know the regulations governing the use of the *Karildex*. Admit me."

She was within her rights. Ketan swore softly and pressed the combination release that swung open the great, wide doors again. "There would be much more time tomorrow," he suggested.

"Not for me . . . not for me." the old woman whispered. "Here, help me up these steps."

He took her hand and it was like

lifting the hollow branch of a rotted tree. It was so light. He knew there was prophecy in her words. There was not much time for her—not much time at all. It drew out a quality of pity in him, for the tragedy of age and death were the supreme of all tragedies to Ketan.

"What is it you would inquire?" he asked, anxious to atone somewhat for his initial brusqueness, and to be free as soon as possible. "Perhaps I could help you at the keyboard."

"None of your business," she snapped. "It's my own affair."

Her reply turned his sympathy cold and he left her inside the door and returned disgruntled to his technician's position. He did not even turn on his position light, but sat in the darkness, watching the distant gleam that hung over the thin, withered shoulders of the old woman who hunched over the keyboard.

He wondered what she wanted. Why had she come alone in the night, hobbling to the reservoir of desires and will of all Kronweld? What possible difference could it make to her or to Kronweld what choice the shriveled creature made in *any* question that was before her?

Ketan's attention was dragged almost against his will to concentrate on her. For a moment, he couldn't tell what drew him. Then he realized: It was the swift click of flashing keys. Ordinarily, the average inquirer punched slowly, one at a time, squinting up at the graphs and dials each time to laboriously interpret the results offered him.

But the old woman was playing upon the keyboard with the touch and speed of a master technician. Only one man had Ketan ever seen who could perform like that at the keyboards. He wondered if she were just madly punching keys or if she were really pursuing a logical inquiry.

At that instant her dry, cracked voice echoed through the dead and silent hall.

"Ketan!"

He started.

Then, more softly, it came again, almost caressingly. "Ketan."

It sent a chill along the back of his neck—the strange tone of her voice. How had she known his name? Had she deliberately sought it from the *Karildex?*

She moved away from the position and came towards him in the darkness. He had a feeling that she could see him.

He turned on the light at his position. "Have you finished?"

"I have only begun," she said waveringly. "I must have the master control board."

"The ma—! That's impossible. Only the First Group and the Council of Seekers have entry to the master keyboard. That is not for general use."

"You have used it tonight," she said. "You altered the setting of the master integration with respect to the Temple of Birth and the Edge. You thought you returned it to the original factors. Perhaps

no one else would ever have detected it, but I have detected it. You would not like the master technician to know that, would you?"

Beads of perspiration stood out upon Ketan's forehead. *Who* was this insidious old woman? His sympathy for her began to turn to fear and hate. He could not afford any involvement over his use of the *Karildex* now that his decision with regard to his presentation before the Seekers Council had been made.

"What do you want?" he said in a hoarse whisper. "Who are you?"

"You have thought to save Kronweld from herself, the slow dying senility she is passing through—like me. That is good. But the enemy you see is pitiful—a trifling matter—compared with the actual enemy that besets Kronweld, of which you know nothing. *Give me that keyboard!*"

"You have no right to it."

"I must have it." Her tone was deadly as if she had power to blast him out of existence if he refused her demand.

"Someone might come—"

"No one will come. No one ever comes this late at night. Give me that keyboard."

The old woman approached him like the menace of death itself. Her green, glowing eyes reflected the position light with an intensity that stabbed through him.

He turned like a machine and went towards the sealed chamber of the master keyboard. His fingers pressed the forbidden combination that he was not supposed to know, and the gate swung open.

"Ah—that is good," the old woman whispered.

Ketan cursed himself for an ineffectual fool. How had she ever determined that he had altered the factor settings of the master integration? The memory circuits were supposed to be perfect. He knew he had returned the integration to normal. It was impossible to detect the tampering. Yet she *had* detected it.

But now the soft click of keys hummed under her fingers. So swiftly did her hands move that the distinct click of each key was no longer distinguishable, but the sounds blended into each other in a steady flow of monotonous sound that was broken only when she pressed the indicator lever and called for an index.

Ketan stared fascinated and helpless. He saw after many moments of intense study that she had reassembled the master integration in almost unrecognizable form. He prayed silently that she had retained all the disturbed factors in the memory circuit so that the *Karildex* might be returned to normal. If she failed to do so, there would be chaos—not only for Ketan, but for all Kronweld.

Abruptly, the chanting music of the keys ceased, and the old woman turned to him. "You are the only one," she murmured. "There can be no other." And suddenly her eyes were piercing his. She stared at him with a quick, mute pleading as if she would bare her entire soul

to him, and tears started in her eyes.

"What do you—?" he began.

She turned back quickly. Her eyes were staring into space. "Three people must die," she said, hardly whispering the words. "Three must die."

III.

Her fingers set themselves to the keys again and moved faster than sight could follow. Then she pressed an indicator key. An index appeared on the panel. Ketan stared at it. With a shock of premonition he recognized Leader Hoult, Head of the Seekers Council. It was he, along with the twenty other Councilors, before whom he would appear with the evidence of the forbidden knowledge he would reveal to all Kronweld.

"Look at the indications of his factors," the old woman commanded.

Ketan looked. There, revealed, were the factors and concepts that Leader Hoult had submitted to be integrated into the mass will of Kronweld. There were the desires and wants and impulses that he had gained through the experiences of his life and made him the man he was. Ketan gave them a cursory glance.

"What about them?"

"Look closely. Watch these that I intensify. Tell me what they are."

Each factor as it was picked from the general graph and intensified was indicated by a code figure on a dial. By long experience, Ketan believed there was no factor code that he could not recognize and identify on sight.

His mind went spinning over the catalogue of infinitely complex combinations that he knew. The number before him was totally unfamiliar. Its strangeness appalled him. A sense of cold foreboding stole along his spine.

"I can't be expected to remember them all," he said.

"Look it up."

He turned to the manual index on the wall and pressed the tabs that corresponded to the index of the unfamiliar factors. The proper defining sheet should have slid out.

There was only a blank.

"You see?" the old woman exclaimed. There was a horrible gloating in her voice. "Now this one."

Another unfamiliar number appeared. The index for that, too, was blank.

"What does it mean? How did you know about this?" Ketan asked in a thin voice edged with terror. "It can have no meaning. There must be an error in the machine."

"An error in the *Karildex?*" The woman laughed harshly. "How many times have you boasted of its accuracy? No—there is no error. Now watch this one."

Another, totally different index flashed before them. Ketan recognized it as taken from the matrix of Teacher Daran, the foremost mathematician of the House of Wisdom. Ketan stared at the row

of factor indexes. Out of the hundreds, there were three that registered blank.

"You see—as hard as they tried to keep them out of their matrices, they failed to do so when the proper influences are subtracted. Look at their matrices."

She made another manipulation and drew from a slot two transparent squares. The surfaces were covered with hundreds of tiny perforations. The woman placed it over a printed sheet and held a magnifying glass over the whole.

"It is perfectly normal to all appearances."

"But what does it *mean?*" Ketan whispered, more to himself than to the old woman.

She answered him. "It means that here are persons within our midst who have had experiences that do not conform to any possible experience available in Kronweld—or in Dark Land or Fire Land, either, for they have been catalogued.

"Can you understand that? No—you cannot. I will tell you. It means they have come from outside!" she seemed to shriek the final word.

"Outside? What is outside?"

"It is beyond . . . beyond the limits of Kronweld. In the world where no man of Kronweld has ever penetrated. Can you not conceive of that? Have you not dreamed of a place of sand and desert and winds and a lone, silent rock that stands like a monument in the desert?"

Her voice had dropped to a low insinuation that penetrated Ketan's mind like a thin knife blade. He trembled and backed away from her, white faced.

"How do you know of that?"

"You are Ketan," she said simply. "I know many things about you."

"How do you know anything about me? Who are you?"

She ignored his questions—and his hands that had seized the thin sticks of her shoulders.

"There is one more index you must see," she said. She shook off his gripping hands and pressed a series of keys in swift order—but the name was left off. The index appeared. He saw a dozen alien, unknown factors in that series, and checked them. Blanks, all.

"Whose is that one?"

She pressed a final key. The identification factor appeared. He uttered a single, sobbing cry.

"Elta!"

The master control board had been set to cancel out the factors of the Temple of Birth, the Edge, the date of the beginning of Kronweld's history, and a half dozen other factors for which Ketan saw no purpose in canceling.

It was in the absence of these factors that the unknown factors on the matrices of the three persons became evident. No one would have discovered them in a thousand *tara* unless he knew exactly what he was looking for.

The old woman had known.

But Elta!

Ketan's mind shut itself against

the significance of her unknown factors. There was nothing uncommon about Elta—except her loveliness, the wonder and beauty of her, the supremacy of her Seeking.

The old woman had said there were three who must die.

"Tell me what this means," he demanded.

She hesitated while her agile fingers began the resetting of the master control board.

"It was a miracle finding you here—to be able to show you these. It was more than I dreamed, to find you right here in the hall of the *Karildex*.

She turned and looked upon him with her old, still-bright eyes. "You wonder who I am? I shall tell you. But there are many things you must know first.

"I warn you that danger and death lies over Kronweld. Already its arm is raised for the final blow to destroy this world. These three are agents of this destruction. There are others, but these are the most important.

"You think me mad? Wait until I am finished. But these three must die. That will be your task. Slay these three!"

His mind spun. He shook his head as if to clear it. He tried to figure out why he was standing here listening to this mad, old woman when he should be calling for a Serviceman to take her away. Plotting death for two of the foremost Seekers in Kronweld—and Elta.

"You are insane—I'll hear no more. You shall tell the rest of your story to the First Group."

"Sit down!"

It was not a mere verbal command. It became a hypnotic leash that reached out and gripped his mind, forced his muscles to hold him fast to the seat before the keyboard.

Against his will, he remained and listened.

"For more than a hundred *tara* an organization has existed in our midst and none have guessed its existence. The final objective of that organization is the destruction of Kronweld. They fear us and they will destroy us. They are the Statists.

"They have withheld the death blow only awaiting the proper time. This organization has used us, used our Seeking; it has drained Kronweld of the secrets of its Seeking and used them against us. Only one more are they waiting for and then their knowledge will satisfy them and Kronweld shall die. That is an understanding of our use of atomic forces."

"You're utterly mad," Ketan said in a low voice. "Do you expect me to sit here and believe such a fantastic lie?"

"What of the factors you could not identify?"

"There'll be a natural explanation of them and I'll find it right here in the *Karildex*. Who would compose such a group? What would be the purpose behind them?"

"I'll tell you who they are, because you alone out of all Kronweld could understand, for you

have seen their world. The world of colored sands and the thin pinnacle of rock, standing like a monument in the desert. They are—"

There was a sudden sharp sound from the door of the hall. It was out of their line of sight. The old woman instantly extinguished the light and slipped away from the keyboard.

In the darkness Ketan heard her hoarse, dismayed exclamation. "Hoult!"

Then she was gone. Ketan hurriedly shut up the master keyboard in the secret panels and slipped away to the other side of the *Karildex*. There, he pressed the button on a position light which was not visible from the door. He set up a sequence and pretended to be studying as footsteps grew nearer in the vast echoing hollowness of the hall.

"Technician!"

The voice rang out sharply.

"Respect to you, sir," Ketan called. His heart was thudding within him. "I am here."

He hurried around the end of the machine toward the leader. Why had the man come, he wondered. He sensed an impending disaster to his plans before they ever began to be put into operation. He didn't want to meet this man now.

He came face to face with him at the end of the monstrous machine.

"Technician!"

"Wisdom, sir."

"I was passing and saw the door open, but no lights. It seemed strange that there would still be inquiries this time of night." Hoult's black eyes looked down from a height that made Ketan look up into them.

"No one was here, sir. I was working on a little problem of my own. I was just getting ready to leave."

"That is good. I commend you for your studiousness."

But Hoult's thoughts were not upon his words. Ketan watched his shining, ebon eyes send a darting glance into the black reaches of the hall. Surely he couldn't *know.*

"There have been reports in the city," Hoult said as if it were an idle afterthought, "of an old, insane woman who escaped from confinement. She has not, by any chance, been near the *Karildex* today?"

Ketan shook his head without hesitation. "No. I have seen no very old persons at all today. They seldom come here. The *Karildex* makes little difference to them. They live their lives without offense or friction."

"Yes . . . well—" Hoult agreed idly with this bit of philosophy while his eyes still pierced the dark shadows beneath the looming machine. "Report at once if you see any such. Wisdom to you, Technician."

"Wisdom, Leader."

The man vanished slowly in the shadows and Ketan stood staring after him. Why hadn't he told the Leader that the mad old woman was here now, hiding in the darkness of the great hall? Was it only that she had threatened to expose his use of the master control board?

She would have a hard time convincing them of that—if they thought she was insane. She could not prove her accusations.

But there was something more that held him back. There were the unexplainable factor indexes, the fact that she knew of his visions of the red desert with the pinnacle—how had she known such a thing—and more: there was something that reached out from that withered husk in intangible and unspoken communication and found a chord of sympathy in his being. He wanted to know who she was. He *must* know.

He turned back into the shadows where he had seen her disappear. He cautiously turned on a single light that dimly illumined the section of the hall.

But she was not there. She must have slipped around the other end of the machine. He raced down the length of a hundred positions and came to the end. Another light failed to reveal her presence anywhere.

Then he saw her.

A distant, dim shadow flitted out from the looming hulk of the machine at the far end. She ran with incredible speed towards the door and vanished into the night.

He raced after her, silently, not daring to call out. At the door he hesitated, the night breeze splashing over his face. But there was no sign of any moving object—only a pair of strolling companions on the far side of the road that passed in front of the building.

No sign of any fleeing woman—an old and withered husk running through the night.

It was useless to attempt to follow her.

She would come again, he knew.

IV.

He closed the doors of the great building for a final time that night and made his way slowly out towards the road. It was late. He wondered if both Elta and Teacher Daran would have given him up. Still, it was not that late. Much of Kronweld's life did not sleep until just before the rising of the first globe.

Thoughtlessly, he had taken his day cloak and now he flung it about him. The heavy, leaded cloth felt good, cutting out the night wind. Though the air was warm, an unaccountable chill stole over him.

After a few hundred steps he identified its source. It centered in the fact of the curious coincidence that on this night he would have met all three of those accused by the old woman of plotting against Kronweld.

He puzzled over Leader Hoult's concern about the woman. Though he had tried to appear calm, it was obvious that he was highly agitated over her. It was too fantastic to believe there could be any truth to the old woman's story.

Ketan tried to shrug away the puzzle, the mystery of it, and the unreasonableness. Almost, it had made him forget the tremendous step he was about to take in proclaiming his discovery of the means of creation of life to Kronweld.

He hurried through the night as if trying to flee from the haunting memory of the old woman's face looming up before him like a dead and shriveled fruit.

He turned into the roadway that led north. A *stetor* distant was the blank curtain of the great Edge.

Never, since he first emerged from the Temple of Birth, had he looked upon that sheet of blackness without experiencing the swift thrill of the unknown that now swept through him, leaving a faint chill in its wake. At times the mere contemplation of the thing left him trembling and weak.

When he had been younger he had often contemplated the possibility of building a rising machine, one that would carry a man high enough to reach the top of the great Edge. He knew that the energies of atomic engines were more than enough to make such a machine possible.

But he knew now that such a dream was a childish fantasy. Nothing could ever go beyond the edge of the Edge. It was nothing, a vast wall of negative existence that stretched from positive to negative infinity. Top, sides, expanse, depth, —all were terms that had no meaning when applied to the great Edge.

An almost physical pain of yearning and desire for knowledge passed through him when he thought of the vast mystery here, a Mystery that no one among the Seekers of Kronweld would recognize—except the Unregistereds. A Mystery, therefore, that had to be examined illegally.

As he walked, staring into the

blackness of the Edge, he thought of Elta. What would she say when he told her he must go to see Teacher Daran? More: what would she say when he told her of his decision? He knew. Somehow—he would have to change her mind about it—

There was a sudden tingling at the roots of his brain. It ate along the nerve channels of his body and turned his quick steps into slow, erratic ploddings.

Before him the infinite curtain of blackness began to lose its empty nothingness. A reddish tinge began to touch the black and Ketan cried out involuntarily.

It was coming again.

Wind began to whip about his head. Sharp daggers of sand, borne aloft on its breath, stabbed even through the heavy day cloak. The reddish sky was brightening and the world became a howling madness of driving sheets of sand and wind.

Kronweld became as if it had never existed.

He was in the midst of a desert, a red, howling desert where life was inconceivable. From horizon to horizon there was nothing—only the bleak vastness of sand and sky and wind.

Except—

Except for a single sliver of rock that broke the bare line between sand and sky, curiously visible as if the driving sheets of sand were transparent.

The pinnacle seemed closer this time. Each time it seemed closer. His feet slogged through the powdery, resistant sand until his muscles ached and cried out for relief. But something insistent would not let him rest. He had to drive on and on, whipped and torn by the ceaseless winds. Perhaps this time he would reach the pinnacle—

Then something stopped him like a thudding blow within his skull. He heard the distant sound as of a human voice, soaring all the way across the reaches of that endless desert, distant—as if it came from the far away pinnacle itself.

"Hasten, Lonely One—your time is short. You must not fail . . . you must not fail . . . come—"

The voice trailed off to inaudibility, and the wind soared in a howling frenzy of madness as if to drive the sound waves back to their very origin and prevent the words from ever having been uttered.

Abruptly, all was gone.

Ketan found himself at a distance from the last place he remembered walking as the vision came. The same distance apparently that he had trudged over the drifting desert sands.

He was dripping with cold sweat that formed in his pores. The sound of that alien, haunting voice still rang in his ears, as if it were the final call of a dying world, and he, somehow, had the strange, unknown power to be its saviour.

He shook off the maddening vision, but his being cried out for relief from it. Sixteen times now he had experienced it since emerging from the Temple of Birth. This

last time was by far the worst. Never before had he heard that voice, never had the winds beat so fearfully.

Never had he told anyone of these experiences.

But the mad old woman who had come to the *Karildex* had known of them. How was it possible?

When would it end? What did it mean?

When he saw Elta sitting among the trees of the small parkway that divided the road he forgot the horrors of his vision. He stood and watched her a moment before she saw him.

Her slim brown body was dark under the violet sky glow that rippled fitfully above them. She was clad only in the universal fashion of brief, white harness that served necessary convenience and protection. Her small, golden head was moving anxiously from side to side, trying to find him somewhere in the darkness.

Music was coming faintly from the outlets of Artist Center hidden among the trees.

He stepped up behind her. "Waiting for someone?"

"Ketan!"

She whirled, startled. "Have I waited? A dozen times I decided to go and then to stay just another while. What kept you so long? Inquirers?"

"Yes—they don't often come this late. But I had some rather distinguished company tonight."

He paused. He wondered if he should go on. All the way from the *Karildex* he had determined to ignore the strange factors he had seen in her graphs, to let it make no difference between them. Now, as he sat down beside her, there was a barrier that the loveliness of her presence, her tender possessing glance would not put down.

"Leader Hoult was in to see me."

"Leader Hoult! What did he want?"

"He was looking—he said—for a little old lady whom he thought he might find inquiring at the *Karildex*."

Ketan paused. Had Elta's face blanched a trifle—her lips shown a momentary unsteadiness? He couldn't tell for sure in the accursed light from the sky.

"A little old woman? Why was he looking for her? Who was she?" Elta's voice betrayed no emotion.

"He said she was insane and had escaped from confinement. The Servicemen were looking for her—and Leader Hoult wanted her found with dead certainty."

"How do you know? Did he say so?"

"He merely mentioned her. His concern was so obvious that I think he dared not stay longer because of it."

"Queer—" she laughed, "the things you observe, tending the *Karildex*. Tell me what else happened today." She drew closer and settled against his shoulder. "It's been so long since I saw you."

"Since yesterday, isn't it?" he smiled. "But I can't stay here. You remember I said Teacher

Daran wanted to see me soon?"

She nodded, dismayed. "And you have to see him tonight?"

"How did you guess?"

"I can foretell things like that. I'll be so glad when you become a full Seeker—and we can make our companionship."

He clutched her hand tightly, though his veins were ice within him.

"Anyway, we can be together a whole day, the day after tomorrow. The *Karildex* will not be open," she reminded him.

"Of course it will! Why shouldn't it be?"

"It's the opening of the Temple of Birth. Had you forgotten?"

"Yes—I had forgotten." His voice was thin. The reminder drove his mind back to the unyielding purpose of his existence—to bare the treachery and fraud of that unholy place.

His mind completed the circle of its problems and came back to Elta. She was looking up at him in the silent, confident glance that bound them tighter than chains and made a great thankfulness well up within him.

And he cursed himself for the things that he was about to say.

"Elta—today I accidentally introduced your matrix into a problem I was working on. Some strange results appeared. I found three factor indexes which are not recognizable by any description in the standard catalogue. It has bothered me a great deal. Do you know what it means or how they got into your matrix?"

Ketan was not conscious of it at first, but gradually he became aware that Elta had become as stone beside him. Every muscle had drawn to the limit of its tautness. She was trembling faintly as if with cold, and her eyes were not upon him, but were staring far beyond him.

When her voice spoke it was like the soft tinkling of ice. "You didn't find those factors by yourself, did you? The little old woman showed you. So she has set herself against me at last—and you had to know it, too—"

"Elta, what are you talking about? Do you know who she is?"

"She showed you, didn't she?"

"Yes—"

Ketan couldn't go on. There was suddenly nothing that he could say, nothing he wanted to say. He felt as if he had touched upon something that would haunt him in dreams through the rest of his life, something horrible and unclean that was ensnaring him and Elta like a trap. If he went along and said nothing, it would die and pass out of existence, but to stir it up, attempt to fight it—

"I knew you would find it some day," she was saying dully. "I knew she could come. What did she say about me?"

"She said I must kill you—to save Kronweld."

Elta gave a quick gasp. Her voice was heavy with sorrow when she spoke. "How she must hate us. What others did she mention?"

Ketan ignored her question and

burst out with the torment that was within him. "Elta! Tell me what this is all about. You talk as if you were in another world and I were nothing but a little actor on a tiny stage with my own insignificant world while you belong to an alien fearful world far beyond my experience. Tell me, Elta!"

"Tell me what your answer to Teacher Daran is going to be."

Her sudden change of subject irritated him. "That's not important—now. I want to know what all this about your unknown factors means."

"It's all part of the same problem. Tell me what your answer is going to be."

"I've got to know what he wants, first." This new track disconcerted him, gave him no time to build up to what he must say concerning his decision.

"Tell me what your answer is going to be. You know what his question is!"

"Well—if he asks me to enter the House of Wisdom and be entrained to take his place, I'll accept it, of course. Any learner Seeker would be glad to have such an honor."

"You don't mean that."

"Of course I do. Naturally, I'll ask for the same privileges all other Seekers in the House of Wisdom have—the right to pursue their own Seeking while there."

"Even if it is unregistered?"

"What do you mean by that?"

"I know you, Ketan. You'll not be content to work in darkness, in secrecy in your underground laboratory while inquisitive Servicemen snoop constantly for evidence of your lawbreaking. You are going to refuse Teacher Daran, aren't you?"

"Yes," he blazed suddenly, "and I'm going to do more than that. I'm going to demand a public hearing before the Seekers Council and tell them I know the secret of the creation of life. I'll expose the deception of the Temple of Birth to all Kronweld.

"Day after tomorrow is the opening of the Temple," he added thoughtfully. "What better time could I have chosen?"

She was silent for so long that he turned and looked down upon her. She had slumped from her stone-rigid position and sat with eyes averted downward. Her hands were composed upon the warm, bronzed skin of her thighs.

"Elta—"

"Ketan, I want the first promise that I have ever asked of you. When the time comes—and it will come soon—when I can tell you what all this means, I promise that I will tell you fully. I promise, too, that I shall never do anything—I have never done anything—to harm Kronweld. The old woman didn't understand. She cannot know that my pain has been as great as hers. I promise that I shall clear up this mystery and you will know and understand that I have done right. I must go away for a little while. When I come back, we shall make our companionship. But you must not attempt to overthrow the Temple of Birth by

declaring your discoveries to the Seekers Council. That is the promise I want of you. They'll declass you. You'll be unable ever to Seek again. I want your promise, Ketan."

"I can't give it. This is the thing I've dreamed of since the first time I was introduced to Seeking. I've known that this was my work. How can you ask such a thing of me, when you won't even explain the slightest fragments of the mystery about yourself? Why must you go away? Where is there to go that I cannot come with you, or follow you?"

"Then at least promise you'll postpone it until I can return to you and explain the things you want to know."

He shook his head. "I can't even do that. I've told the Unregistereds what I plan to do. No other time will be so appropriate as this once in a *tara* opening of the Temple. If I failed now, the Unregistereds would disintegrate and be exactly as they were when I began. I cannot wait!"

Elta had straightened to look into his eyes, but now her shoulders slumped again. Her lips moved impulsively, silently. At last she said, "You're a fool—a wonderful, idiotic genius of a fool. And I love you so. I wish often that I had never met you. I wonder how it will all end?"

"How would you want it to end?"

"How?" She looked up at him again and then away to the shimmering curtains of light in the sky. "Like we always dreamed it would end. You and I going away into Dark Land, continuing our work there, proving you are right about the creation of life in absolute freedom. Oh, I know we're not free here. It irks and drags on me as much as it does on you. But we can't turn the whole of Kronweld upside down because we've discovered something there's no hope of making them believe. Let's go to Dark Land—some of the others will go with us. We can build a community and a life of our own, far away from all this."

"You'd die out there, and you know it. We aren't made to live like Bors. We're men and women. And we've a duty to Kronweld, a duty to Seeking."

"We could carry out that duty in Dark Land—"

"But not until we've tried here, first.

"I must go," he said abruptly, "Teacher Daran will not wait all night. I must see him. Will you go with me?"

V.

Elta remained outside the gate opening on the short path that led to the garden. Ketan walked slowly along it, alone, clutching the thick day cloak tightly about him.

Teacher Daran was relaxing beside the fountain that spumed up in the midst of his garden. Brightly colored, phosphorescent muds spouted into the night air through an artificial orifice and fell back in a sluggish stream that

flowed through a carefully channeled way and then sagged into the bosom of the earth again. A soft curtain of steamy mist floated over the garden towards the plain marble house where Teacher Daran lived alone. He had never taken a companion.

"Wisdom." Ketan approached through the curtain of mist.

Teacher Daran rose on one arm. He had thrown aside his day cloak and had been lying with eyes shut, enjoying music that Ketan knew was coming from Artist Center.

"Wisdom," Teacher Daran responded. His eyes tried to pierce the darkness and mist. "Is it you, Ketan? My eyes are weakening more each day. Come—you are wearing your cloak when it is nearly night?"

The old man chuckled. "What is it, Ketan? You come in the midst of the night with your day cloak and it is you who are always preaching that we are weaklings because we must wear the cloak at all. You say we should go without protection as our predecessors did."

Katan threw aside the heavy garment of lead strands.

"You asked me to come, Teacher," he said.

"Of course. It is simple," said Teacher Daran. "Recline."

Ketan dropped beside the old man. The Teacher's great body was lined with the marks of age, but it was still filled out with smooth rippled muscles of strength, and the massive chest rose and fell with long, regular rhythm.

"The Council of the House of Wisdom has appointed you to fill my place."

Ketan supported himself on one elbow gazing for a moment into the eyes buried deep beneath the overhanging crags of the man's forehead. He thought of the unknown factors in the matrix, and the old woman who had come to the *Karildex*.

"I would become a full Seeker, then?"

Teacher Daran smiled and nodded. "And you could make your companionship with Elta at once. You don't know how fortunate you are. Perhaps if I had found such a Seeker companion when I was young—"

"I would be accorded full rights of Seeking—the privilege of choosing my own Mysteries?"

"Subject only to the approval or rejection of the Council," the Teacher nodded.

"I do not recognize their right to pass upon the Mysteries I choose. Why should they have power to tell me that I may not choose the Mystery of the great Edge, of Fire Land—or even of the Temple of Birth itself?"

"So the things they whisper about you *are* true?"

"What is whispered about me?"

"In the Council of the House of Wisdom have come reports of an organization called the Unregistereds—who confine their Seeking to unregistered Mysteries. There are those in the Council who say you are one of those. Many times it has been talked of—the desirability of making a complaint to the First

Group. Because of the excellence of your work with the *Karildex* I have been able to persuade them from taking such drastic action, and even to put through a vote for you to fill my place.

"I am warning you severely, Ketan, as a friend and as your Teacher, that you stand on very dangerous ground. How can you possibly say that you challenge the right of the Seekers Council to supervise Seeking when you are so expert in operation and knowledge of the *Karildex?* Surely you must know that the Council's commission was a direct solution given out by the *Karildex* three hundred *tara* ago."

"And that is the very reason I challenge the restrictions! The integration of the *Karildex* is based upon false factors."

"How can that be? The integration is renewed twice every *tara* and may be supplemented any time a person so desires."

"The integration reflects only the knowledge of the individuals assembling it. If that knowledge is false, the integration is likewise in error."

"And just which factors do you claim to be false?" Teacher Daran spoke the words very evenly.

Ketan pressed his lips tightly. "You know the ones. I haven't been silent about them."

"Then it *is* true—what they say about you. I have been a fool to try to defend you before the Council of the House of Wisdom. It is true that you deny the sacred aspect of the Temple of Birth and advocate its removal from the category of sacred Mysteries. You believe it should be opened to the profane study of all Seekers in Kronweld?"

"Advocate? Believe? I demand it!"

"I shall make a complaint against you tonight. This time tomorrow will see you declassed."

Elta was waiting at the end of the path, her slender form silhouetted against the sky. She stretched out a hand as he approached.

"What did you tell him?" she asked anxiously.

Ketan told her briefly. "He is issuing a complaint at once. I must hurry to the house and get my materials ready. I shall ask for a hearing, a public hearing."

"Ketan—no! Please, for my sake. Go back and ask Teacher Daran to withdraw the complaint. He will accept your apology, I know. Tell him you will take the position offered."

"I shall ask for a hearing," Ketan said. "Kronweld must know the truth about the creation of life, and the Temple of Birth must be opened to Seekers."

"You fool, you unutterable idiot!" Elta hurled at him. Her flame-blue eyes flashed a reflection from the sky.

But Ketan had turned to the road. "I must hurry. I'll walk as far as you are going. Are you coming?"

They turned out from the private path to the main road whose green, glassy surface stretched away in a great circle which passed be-

fore the magnificent Temple of Birth in the near distance.

They walked along in silence, intent upon the sky reflections in the road surface. The road led out of the more luxurious section of the city where lived those entitled to luxury, the full Seekers, the members of the First Group, and the managers of production. Elta lived closer to the center of the city in a group house of Seekers.

Ketan lived on the other side with those entitled to less, the learner Seekers. And here it was that most of the population of ten thousand lived, for there were few full Seekers. Nearly all Mysteries had been solved. Man had reached a point near the apex of his available knowledge. The unavailable knowledge—the sacred Mysteries—constituted those things that were not meant for man to know.

The city was laid out in a great circle that stretched before the pair as they walked in the darkness. It was bounded on one side by the volcanic, radioactive Land of Fire that lit the entire sky with its blaze of violet and crimson lights. Beyond it lay the eternal wastes of Dark Land with its perpetual pall of clouds and fog of smoke and ashes that were carried by the firece winds that spewed out of Fire Land.

Ketan and Elta came out of the overhanging garden growth that lined the roadway into an open space. There they paused as Ketan looked up. He gazed at the other boundary of Kronweld—the Edge.

No words of description could convey the appearance of the thing. It was simply nothing. A vast, unknowable curtain of nothing, a terrifying blackness that stretched between the impassable horns of Fire Land that met it at either end of the encircling arc encompassing Kronweld. And stretched to infinity above.

It was the Edge.

"Can't you feel it?" whispered Ketan. "Haven't you ever known a longing, a yearning rising up within you, telling you that there is something there that man may know. Something beyond the apparent nothingness of the Edge, calling you to break through, to discover the great Mystery that lies beyond it."

Elta shuddered. "Don't ask me to partake of *all* your blasphemy. The realm of the God lies beyond the Edge. No man shall ever know what lies beyond the Edge."

"Pah—! *I* know what lies beyond. I have seen it."

"You!"

"In vision I have seen it. There is a great land of desert. Red and white sands stretching from horizon to horizon. There is no Edge there. Only a circle of blue sky that reaches the ground all around. It is hot, and fiery winds sweep clouds of sand like a million sharp needles through the air. And in the midst of this desert is a pinnacle. Some day I shall reach it. There is something there. I do not know what it is, but I shall find out."

He stopped and stared down at Elta as she fell behind him. She had ceased walking as if frozen in-

stantly. Her hand went to her mouth as she backed slowly away from him.

"How do you know of this thing? It can't be true. Ketan . . . Ketan, you must never try to find this pinnacle. You must not find it. Say you will not.

"I will go with you, now, tonight. We shall make our companionship and we'll go wherever you say—here or in Dark Land. I'll never leave your side again, Ketan. Only promise me you'll forget these horrible things.

"Let us go back to Teacher Daran. Go into the House of Wisdom. He will withdraw his complaint."

Ketan smiled wryly and looked far beyond her. "You'd hate me forever if I did."

She trembled as if with cold.

They came soon to a curve in the road that led around the large restricted parkway surrounding the center of all Kronweld, the holiest spot of ground that existed—the Temple of Birth.

Gleaming white even in the black and violet of the night, the thick, mighty walls of the Temple gave forth their own inherent light.

The structure was a quarter of a sphere resting in the corner of the intersection between the Edge and the surface of Kronweld. As always, faint strains of music came from far away, from somewhere inside the Temple itself. Through the vast gardens a faint wind rustled the trees and drifted perfume from the flowers.

They walked slowly on the outskirts, not daring to cross the gleaming purple line around the Temple, beyond which no one could trespass and live.

Ketan recalled a few *tara* before; he had watched an earnest, foolish young Seeker dash across the forbidden line in fanatic defiance of the most sacred laws of Kronweld—and vanish in a puff of flame.

Terrible atomic forces lay quiescent in the thin line. They held fast the secrets of the Temple of Birth and lashed out with unrelenting death upon the Seekers who trespassed.

Ketan paused opposite the center of the forbidden arc. Before him, the scene was like a vast stage—the great black curtain of the Edge stretching to infinity and the chill, mysterious Temple lying at its foot.

Directly before him, in the center of the garden, stood a glorious golden statue, four times life size. It was of a dancing girl, poised on tiptoe in a graceful pirouette, laughing up at the sky. Transluscent, beaten gold leaf formed her swaying skirt.

She was the first woman.

A thousand *tara* ago, the first woman had found the first man, immature and elemental, who had been created in this spot. She had cared for him until he reached maturity. Then she had directed him to build the great Temple into which she had disappeared and he never saw her again. All creation henceforth had taken place within the Temple of Birth.

Once each *tara* thereafter the

gates of the Temple opened and a new group of human beings emerged and were led out into the world.

At the same time, women of Kronweld who volunteered for lifetime service entered the Temple to spend the rest of their lives in the service of birth. They were replacements for those who had died during the *tara*.

Katan viewed the building somberly. "I'll destroy that some day," he said softly. "It's like a horrible disease in the flesh of Kronweld. If it were not for that building and the secrets it keeps from us, we would have known the secrets of life long ago. We would know the origin of man. We would perhaps know the solution to the Mystery of the Edge."

"If it doesn't destroy you first," said Elta. "Let's go away. It makes me afraid."

They turned away in time to see a two-man car glide silently up beside them. Instantly, Ketan knew its purpose. Elta felt a chill of dull fear close in upon her.

Servicemen.

They climbed out and approached Ketan.

"You are learner Seeker Ketan?" One of them spoke in statement, rather than question.

He was a round faced, paunchy man who spoke with the pride of one who had been unable to achieve the heights of Seekership, but who held occasional authority over them as an emissary of the First Group.

Ketan nodded slowly in answer to the question, and remained silent.

"You are requested to return to your house and appear before the reprimander of the First Group by the second rising."

"Who makes a complaint against me?"

The fat Serviceman leered smugly. "You have made no secret—"

The taller, more dignified Serviceman interrupted. "Respect to you, learner Seeker Ketan—it is Teacher Daran who has brought your name before the Group. We but carry out our mission. May we accompany you?"

Ketan looked at the man's earnest face intently. He knew the man's story as certainly as if he heard it from the man's own lips. He had seen these Servicemen before—too fumbling and unthinking in their habits to ever become Seekers, yet worshiping fervently at the shrine of Seeking. He knew the duty of his arrest must pain the man.

But the other was impatient. "At once, if you please!"

Ketan turned, ignoring the Serviceman's insolence, and murmured a word to Elta. Then he stepped into the car, leaving her staring in unbelief.

VI.

Elta stood motionless in the night until the car had long disappeared around a turn in the road. Above her the reflected lights of Fire Land whipped in mad patterns of color

that turned the landscape into a living, twisting thing. It writhed as if reflecting the torment of her own mind.

Swiftly, then, she turned and retraced her steps. The soft night wind touseled the golden strands of her hair as she turned into the path leading to the garden of Teacher Daran. He was still reclining on the grass listening to the music.

She approached through the mist floating over the garden.

"What are you going to do with him?" she demanded without preamble.

The old man looked up with a slow, knowing smile. "Do? My dear, there's only one thing we *can* do with him. He must die, of course."

Elta's crying fear jerked and tore at the bands of her self-control. "Can't you think of any other solution to human problems but death? Is your mind so far gone in its dotage that no clever solution is at all possible now?"

"Sorry, Elta," he said maliciously, "but I'm afraid you can't scold me into saving your lover's life. He threatens our whole existence. In the hundred and twenty years that we have been here he is the first man of Kronweld to become dangerously aware of us. He will discover us completely if he is allowed to go on."

"The first except Igon and all those who followed him."

"We took care of them—just as we are going to take care of this Ketan."

At that moment a tall, magnificent figure approached them through the streamers of vapor that tumbled from the mud fountain.

Teacher Daran turned slightly. "Recline, Leader Hoult," he invited, his voice edged with a trace of mockery.

Hoult ignored it. "Did you know that Matra was out of the Temple tonight?" he demanded.

"No!" Daran leaped to his feet. "Whom did she see?"

"Our fair companion's lover, for one thing. She would be sure to go to the *Karildex* to try to spot us, but I went there tonight and found Ketan pretending to be working on a problem. It was obvious when I mentioned her that he had seen her. How much she found out, I don't know. I've long suspected that Ketan knows the operation of the master keyboard."

He turned meaningly to Elta. "How much did he tell you?"

She hesitated, looking from one to the other, and then her fear exploded into catastrophe. It was no use trying to shield Ketan from what they were certain of.

"He merely told me that you had come there, looking for an old woman."

"That means she found us, then," Daran swore volubly.

"Why do you say that? You always jump to conclusions."

"And usually correct ones, my dear. You see, if he hadn't known that you were one of the Statists, he would never have told you merely that. He was simply testing you. I hope you didn't react—

though you probably did."

Elta let her glance fall away from the two. Her heart was sick and weary within her, sick of the years of deception and falsehood. She stared for a seeming eternity into the bubbling mud pool.

"All right," she said at last. "He does know of us, then. He told me that Matra had found us. He knows about me but is unwilling to believe it.

"As to the duties I was given to perform here, they are now complete. My sister has the complete information on atomic power. It is in a form that our leading engineers can understand, this time. Nothing more is needed. Therefore, I withdraw. I ask for your mercy upon Ketan. When he comes before the Council, your power is sufficient to have him exiled to Dark Land. I will go with him. We shall live out our lives in Dark Land and you can go with your miserable struggle to sustain your futile position. You can carry that word to my beloved father," she said with bitterness. "But let us live—even as savages—and we shall be grateful never to see your faces or hear of you again."

"You pretend that you would give up all you have known in exchange for the Bors of Dark Land—and your Ketan!" Daren laughed softly. "You expect us to believe that!"

"I wonder—" Hoult said thoughtfully. "Perhaps she is right, Daran. Surely we could spare that much mercy for one who has served the Statists so faithfully. You say the complete information on atomic power has been turned over to your twin?"

"I don't trust her any more than this one," Daran exploded hotly. "She is hungry for power. She would slit the throats of all of us if she thought it would do her any good."

Elta smashed the open palm of her hand against his face. Hoult chuckled.

"Daran is simply too suspicious and bloodthirsty. I think we can grant you that much mercy—providing what you say is true. If we have the secret of atomic power, we will seal up Kronweld forever, and let it die. If you wish to die with it, that is no concern of ours."

"Thank you."

She turned after a moment and strode away from them through the fog.

Her heart was heavy. She knew she had failed. They had not believed her. Only one more desperate chance remained. She must go back to her father as quickly as possible. Yet it would not be possible at all without the knowledge of Hoult and Daran. She must find a way to keep it secret.

The two men watched her slim figure disappear like a wraith in the mist.

"You're a fool," Daran croaked. "Do you think for an instant that she will be content to live in Dark Land? If we should seal it up, they would be at work breaking through the very instant we did. Men like Ketan can be conquered only by death."

"I've often noticed a quality in the old," replied Hoult with intent thoughtfulness, "they have a tendency to simplify matters so, and deal directly when subterfuge is much the more effective. Do you think for a moment that I have the power to cause abandonment of our predetermined plan of utter destruction of Kronweld—because of an idle promise to a lovesick girl?"

For the entire distance to his home, Ketan saw only the smooth cast surface upon which they rode. His head was down, the tight planes of his forehead pursed with somewhat nervous determination.

His hands grasped the lapels of the day cloak which he had thrown needlessly about his shoulders again and drew it tight, outlining the slump of his shoulders which the Servicemen interpreted as dejection.

They knew Ketan's house and drew up before it without asking for direction. Slightly ahead of them, he entered the house first and light flooded on. Ketan threw aside his cloak and motioned the Servicemen to lounges. It was their right to his hospitality for the night while they kept a formal watch over him.

They sat down. The paunchy one began toying with the refreshment levers on the panel at his side.

"Help yourself," Ketan invited.

A tray swung out beneath the refreshment panel, bearing the food and drink the Serviceman selected. He offered some to his companion who shook his head irritably.

Ketan went immediately to a desk, selected a sheet and began writing after first adjusting the stylus to *permanent*. Its delicately heated tip began burning words into the treated paper.

While the Serviceman gorged, Ketan wrote furiously, and when he was through, Ketan rose. His eyes were filled with suppressed emotion and his cheeks were flushed.

"Take this to the council at once," he ordered.

The two glanced at the sheet. The taller looked across at him. "You don't dare—the risk is too great for so little."

The paunchy one set down a glass and eyed him. "It isn't many learner Seekers who tempt the Seekers Council this way. If you take what's coming to you, they will simply order you to cease your inquiry into the lines that Teacher Daran has complained of. Why tempt them to throw you down to ordinary Servicemanship—like us?" He leered with curiosity.

"A full hearing before the Seekers Council is my privilege," said Ketan. "I am asking a public hearing. Carry the message."

The Serviceman took a final swallow from his glass and stepped out to the car. As leader of the two, it was his duty to carry Ketan's appeal to the First Group, but he was reluctant to give up a night of ease in Ketan's house.

"You were not always a Serviceman?" Ketan settled on the lounge

and turned to his remaining attendant.

The man smiled a wry, wistful smile. "No—respect to you—may I speak as a co-operator?"

"As an equal," Ketan assented.

"I am Varano. I proposed the cultivation of the creatures of Dark Land for food—that we might find an excellent and useful source of food there. Igon and others were forced to use them when they became lost there. I was declassed for my barbarism."

"So you were the one. I remember the instance." Ketan looked at the Serviceman quizzically with a half smile on his face. Then he indicated the buttons on the refreshment panel.

"Push the blue one down twice and pull up on the red one."

"Pull *up*—?"

The Serviceman, Varano, obeyed wonderingly. Then his eyes popped and his mouth hung open. The tray swung slowly out bearing a steaming slab of browned meat.

He leaped up and glanced furtively around the room as if hidden eyes might be watching him. "Hide it!" he cried. "You could be declassed for life on the evidence of this."

"You are the only one in the vicinity with authority to bring that about. Taste it." He motioned towards the thick steak.

Slowly, the Serviceman sat down again. "What do you want of me?"

"Nothing. Just thought you'd like a little more substantial nourishment than your fat little friend had."

The Serviceman deliberately cut a piece from the steak and ate it. "You're a queer one, Ketan. I wish we'd met—before. But all that is vain. There is no hope for either of us. You will be declassed as surely as the two globes rise tomorrow. Kronweld must protect itself from your kind—it is too small to hold you."

"What about yourself?"

Varano shrugged. "It's all settled and I've forgotten the ambitions I once had. It's just as well. The First Group knows best. I'm in the place I belong."

Ketan shook his head. "I know your kind. You've let them beat you down until there's nothing left of the things you once dreamed and planned. You're nothing but an empty shell, doing the bidding of a bunch of worn out old men and women."

Varano flushed and rose slowly. "You forget my purpose in remaining here. It is not your province to insult."

"Sorry." Ketan rose. "You don't need to get so stiff about it." He hesitated, then: "Come with me and I'll show you what I am talking about."

Varano hesitated, then followed as Ketan led him out of the room and down a short corridor past his laboratories. At the end, they came to steps leading downward. It seemed to the Serviceman that there were hundreds of endless steps burying them ever deeper in

the ground as they plodded down the lighted way.

They made a turn and came to the bottom at last. The room was white walled and perfectly blank on its four narrow sides. Ketan whistled a low tune and a panel slid aside revealing an immense cavern beyond.

From somewhere deep within it came a low growl and a steady rumbling that pricked the short hairs on the back of Varano's neck. An unfamiliar rank odor stabbed at his nostrils.

"The source of your steak. Come along."

They entered and the door closed behind them. The room was large, equipped with Seeker's tools such as the Serviceman had never dreamed of, but that was not strange to him. It had been a long time since he had worked in a laboratory.

They passed on and came to a darkened corridor in which the fetid smell became stronger and almost sickening.

"They can't stand much light," Ketan explained.

As he spoke, they stopped before a barred partition and he switched on a low light.

The Serviceman could not conceal the impulse of horror that leaped within him. "Bors!"

A great, shaggy beast rumbled towards them, head lowered, red eyes glowing malignantly out of the darkness.

It stood half again as high as a man and its head looked like a huge black boulder surmounted by twin curved horns that hooked out menacingly. It snorted and pawed the floor, creating a dull thunder that echoed in the cavern.

The Serviceman backed fearfully. "But—how did you ever get

it here?" he cried incredibly. "I tried, myself, long ago. The ban—"

"The ban is easily evaded," said Ketan, "if one is resourceful. But that isn't what I brought you here to see. Look."

The Serviceman turned again. Now, a second beast, slightly smaller than the first was approaching with fearful inquisitiveness.

"Two of them—"

"Yes—two—the two I brought with me from Dark Land in defiance of the ban our stupid leaders insist on against the bringing of any life but human into Kronweld. I followed the Bors for many days alone until I found their lair in the darkest parts of Dark Land. There I found small Bors, not these great beasts—do you understand what that means?"

Ketan had grasped the harness strap of the Serviceman in a fierce grip and now his eyes were boring into those of Varano. The Serviceman returned the gaze as if hypnotized.

"Do you understand what that means—Bors an eighth the size of these animals? I brought three of them back with me. One we have eaten. Now look into the cage and tell me what you see!"

The very fierceness of Ketan's emotion turned the eyes of the Serviceman to the cage and then he cried out: "Back in the corner—a third—it is a *baby* Bors!"

"Now do you believe I have something to tell the First Group—to tell all Kronweld. I have found the secret of life itself."

VII.

The Serviceman had fallen asleep on the lounge and was emitting rumbling snores. But there was too much to be done for Ketan to sleep much.

He first drew out his own car and loaded it with the plates and exhibits to present before the Seekers Council. It was nearly time for the rising of the first globe when he had the last of the dozens of plants stowed away, and behind the car was a massive, soundproofed trailer in which reposed the family of Bors.

This work completed, he sat down with heavy weariness before his communicating plate and ordered a connection. Shortly, Elta's face appeared on the plate. Her eyes were dry now, but red from past tears.

"What has happened?" she asked.

"Nothing—yet. I just called to tell you my application for a public hearing has been entered and I'll soon be on my way. Wish me success, won't you?"

She did not answer, but merely stared at him with her wide, lambent eyes. He returned her gaze softly.

Always he experienced that inexplicable feeling when he looked upon her. Companions were supposed to be chosen according to affinity between the works they were doing as Seekers and servants of Kronweld.

But Ketan knew he had not approached Elta simply because she was the foremost Seeker in her sec-

tion of Physical Reactions. He often wondered if she felt the same about their coming companionship as he did—and wondered if there were something wrong with him for feeling as he did. It was something about which no one ever spoke.

At last she said, "So you did it! Oh, why will you rush on so blindly before you—*know?*"

"I know enough to be sure that this is the only way progress can be made against superstition and blindness. You've got to smash through it and batter it down—or else live in its smothering encirclement."

"Not when you have nothing more to offer than you have."

"I have all I need. I have my plants and I have the Bors. What more could they want?"

She gazed at him long and fondly. "There is one thing more that we might offer them—you and I—"

He shook his head. "I don't dare, yet . . . not *you*, Elta—"

"Of course you don't, because you don't *know.*" She shuddered slightly as if with cold and her tousled, fire-gold hair fell across her face.

"There can be only one result." Her voice became a monotone of resignation. "You will be declassed—never again will you be able to Seek. Never will you be able to find the answer to any of the Mysteries that exist."

She looked up now in firm decision. "This will be the end of the life we've known, Ketan. Don't wait for the hearing before the Council—flee for your life. Even though you may be merely declassed now, there are those who will not let you live. You are too dangerous to those whose personal ambitions demand the destruction of Kronweld. Hoult will not let you live! Go into Dark Land, now—tonight. Wait for me there. I will come to you soon. You must do this, Ketan, believe me!"

Her pleading, agonized image grew larger in the plate, until he seemed to be able to reach out and touch her. The intensity of her expression held him entranced.

She cut off.

He realized absently that the plate had turned its normal blank gray. He tried to call back, but she refused to answer.

Slowly, he turned away from the instrument. What had she meant by saying that he must flee for his life? Had she told Hoult and Teacher Daran that he knew who they were? Did they know that the withered old woman had given him her command to slay all three?

He shook off the thought. Elta would not have betrayed him.

The second globe had almost risen when he woke. He brushed a hand across his face and struggled up. He hadn't intended to go to sleep, just take a moment's rest.

The entrance signal was jangling furiously. He whistled a note and the portly Serviceman rushed in.

"The Seekers Council are not accustomed to waiting," he snapped.

"Maybe some of us aren't as

anxious to obtain declassing as you were."

They turned at the sound of the voice. The second Serviceman, Varano, stood in the doorway, sharp-eyed from his night's sleep. His leader snapped a look that Ketan knew would be followed later by reprimand.

Ketan hurried out of the room to get into his harness and finish his preparations. He returned shortly and anounced his readiness.

The shining white cube of the House of Control lay in a straight line through the city from the Temple of Birth. It was the edifice second in importance in Kronweld.

Ketan led his car along a road that disappeared directly beneath the building. Down a steep, brightly lit corridor they rolled until they came to the huge freight elevator that would carry his exhibits up to the hall of justice.

The high, shining corridors of the building were frigid in their marble hardness. Their footsteps rattled against the walls until their marching sounded like an approaching mob.

Ketan had expected to see a large number of people filing into the hall, but the corridors were empty except for the three of them. The paunchy Serviceman seemed to read his thoughts.

"I neglected to tell you previously that the Council rejected your application for a public hearing—they said it was not important enough to warrant a public proclamation. The hearing will be before the Council only."

A cold premonition gripped Ketan. He knew that the Serviceman's neglect was deliberate, and he sensed the refusal of the Council to grant a public hearing was a deliberate plot against the spreading of his revelations among the populace.

Half the effect would be nullified if he spoke only before the Council. He had counted strongly on making an appeal to some of the Seekers who might be in the audience. He knew they would be easier to convert than the Council itself. Now, the stiff and barren-minded Council would form his only audience.

He was on time. The clerk read his name as the two Servicemen escorted him into the sumptuous hall.

Beneath the high ceiling of glistening gold and marble was the Council table. From it, twenty pairs of eyes turned upon him—only one member was absent.

Some of those eyes focused on him in wrath like a burning glass. Some curious, some quizzical, some squinting in disbelief, all amazed at what they saw.

Not once in ten *tara* did a learner Seeker demand an appearance before the Council. Not one in a hundred who did escaped declassing.

Ketan's black hair that spilled in a half touseled way above the edge of his forehead bespoke youthful incompetence, but the deep-set eyes beneath stabbed out uncomfortably at them, as if guiding a mind-probing ray that bit deeply into the inner thoughts of each of them. Several

glanced away in discomfiture.

They were ringed in solemn dignity about the outer edge of a semicircular table. To the hollow space in the center Ketan strode slowly and with deliberation. The Servicemen left him standing alone in the center of the great hall and departed. Varano gave his hand a brief grip before he disappeared.

Opposite Ketan sat Leader Hoult. A solemn black cape hung from his shoulders in useless semblance of a day cloak. His black eyes glared upon Ketan—and held his inner thoughts in utter secrecy.

Ketan returned his gaze, wondering how much the man knew, wondering what kind of a double role the man was playing.

"We have previously heard the complaint of Teacher Daran," he said. "You have asked for a hearing before the Seekers Council. You may make any statement you see fit. You have the privilege of the Council. Proceed."

A pounding began to rise in his chest, but it quieted when he started to speak.

"I have not come before you, respected Seekers, so much to answer the complaint against me as to ask a question of you and to present the results I have obtained in my Seeking—Seeking which I frankly admit to be in the realm of forbidden Mysteries."

A sudden shifting rippled through the Council. Shoulders hunched forward as if they were preparing to leap on him en masse.

"You admit such?" the Leader asked. His eyebrows raised like a shaggy brush. Ketan thought he looked suddenly disconcerted.

"I state it. The question I ask is why is the Mystery I have chosen forbidden? What is there that we are afraid of?"

"Just what is this Mystery you have chosen?" an ingratiating voice came from one end of the table. He turned and recognized Anot, the newest member of the Council, who had performed much applauded Seeking into the structure of the ground beneath Kronweld.

"It is the Mystery of us—you and I. Why we are here . . . how we came here—"

For a wild moment he felt a terrible surge of panic and uncertainty. What was he doing here? How could he ever tell these stone-faced cadavers how he felt at night looking up at the terrifying blankness of the Edge—the surging mystery of the Temple of Birth—the threatening unknown of Dark Land —They had never known the feelings that were locked within him.

"It is the Mystery of existence, the Mystery of life that I would Seek out—"

"You are not very clear," said Leader Hoult.

"Look, let me show you."

Ketan's exhibits were being rolled into the hall from the rear. He retreated, then pushed forward a rolling table on which some of his plants had been placed. He set up his screen and his projector before them.

"Why is it that man found no life

in Kronweld when he came?" he challenged rhetorically. "Why was Kronweld a barren world for so many long *tara* until Igon pierced Fire Land and brought plants—trees and flowers—from Dark Land? Why do we yet have to bring all plants from Dark Land into Kronweld?"

"Such questions are adequately answered by our religion. Seekers have no concern with such."

Ketan turned to face the quiet voiced speaker who addressed him. It was bland-faced Nabah, representative of religion on the Council. For many *tara* he had struggled for a place on the Council to control and preserve the sacred Mysteries from the prying of too energetic Seekers. Ketan knew that here was a man who would stab him in the back at every turn.

"The God placed man in Kronweld, and plants in Dark Land. That is the proper province of each. Question not the disposition of the God," Nabah intoned from his creed.

"Then man defies the God each time he brings a plant into Kronweld?"

The room was still and all eyes were intent upon Ketan and Nabah.

"Man is the master of all," the latter said. "It is his privilege to do as he wills with the materials of Dark Land."

"Then it is his privilege to open all Mysteries connected with the plants of Dark Land. That is a thing which I have sought—and found. Look."

He flashed a drawing on the screen before them. It was a skeleton outline of a flower.

"This blossom may represent the flower part of all plants, for all of them contain these essential parts in one form or another. We have in the center an elevated stalk with a bulbous form at its base containing small ovules.

"Surrounding this stalk are numerous small filaments bearing minute grains of powder. When these grains light upon the central stalk of this same flower—or more generally, of the flower of a neighboring plant—the grains pierce the length of the stalk and subsequently unite with the small ovules in the base."

"That has been known for many *tara*," said Leader Hoult. "Have you nothing new at all to offer?"

"I have this: Can any of you tell me the purpose of this strange mechanism which is universal among plants in one form or another?"

Nabah smiled across to Anot. Members of the Council ill concealed their affected boredom. Leader Hoult said, "You are young, Ketan, and you have as yet learned little of the traditions of Seeking which have been firmly established among the great in Wisdom in Kronweld. There was a time once when it was the proper thing to inquire of every new discovery in nature: 'What is the purpose of this thing? Why was it formed so?'

"We have long since ceased to so concern ourselves. We accept the existence of such things and the

Wisdom of the God in so forming them, and let it be an end to the matter. It is not Wisdom to pursue Seeking to absurd lengths."

"Neither is it Wisdom to cease Seeking while still in the folds of ignorance," Ketan blazed recklessly. "It is little wonder that no truly great Seekers have been found since the great Igon did his work—and was exiled and nearly slain for it. Seekers since then have been stifled by the traditions that have crusted about our Wisdom. I have broken those traditions and see what I have found!"

He held up a handful of small seeds. "Within these ovules—into whose purpose you never thought to inquire—is the potential creation of new plants. I have put some of them in moist ground and supplied them with conditions as they are in the Dark Land and this is the result."

He swept a hand towards a row of twenty plants, varying systematically in height.

"These were created one day apart, and each came from one tiny ovule. Respected Seekers, we have in our hands the secret of life itself."

A wave of frowning consternation swept through the Council. Someone—Ketan didn't see who—murmured, "A commendable work, if this thing be true."

But Nabah was instantly on his feet. "See how he blasphemes! I call now for his declassing. We cannot have such among the respectful inhabitants of Kronweld. There is nothing such a man would not do. Listen to him: 'We have in our hands the secret of life itself.' Next he will propose that we open the Temple of Birth to all Kronweld!"

It was a shocking, unseemly thing, the way Nabah ranted. And Leader Hoult seemed utterly disinclined to control him. Suddenly, Ketan saw the pattern of the opposition. While there was no actual collusion between them, Hoult was giving Nabah free rein and counting on the nature of the man to sway the Council to condemn Ketan.

Yet Ketan hesitated in accepting such a picture. It was a poor game, seemingly, that Hoult was playing. The other members had an instinctive dislike for Nabah; they would not be overly inclined to accept his leadership in pronouncing sentence. Either that, or Hoult was so confident that Ketan's presentation would be so weak it would require no more opposition than Nabah could influence.

Deetan, one of the elderly women Seekers on the Council, ignored Nabah's protests. She addressed Ketan with interest. "If this is a natural thing, and the way plants are created in Dark Land, why is it not a common thing in Kronweld? Why must all plants be brought here from Dark Land?"

Ketan shook his head. "That is yet another Mystery, one on which I have found no Wisdom. Much work remains to be done on the entire matter. I have made but a beginning."

Deetan turned to Leader Hoult. "I find nothing that blasphemes the God in this man's Seeking. I offer my commendations. He has opened a wonderful new field to us."

Leader Hoult nodded. "We shall Seek into the matter further."

Ketan looked at him in astonishment. He saw unmistakably that Hoult was dismayed by the turn of events. But there was a crafty reserve in his eyes.

Ketan knew what that reserve was. Hoult was sure Ketan had not finished.

Should he go on, he wondered. He could stop now with the achievement of having opened the study this far. But he could not stop now. This was only preparation for what was to come. If he stopped here, he would fail.

"Have you more to show us?" Hoult leaned forward with feigned interest in the actual work.

"I have more," he said. "When Igon first went into Dark Land you remember that men of Kronweld could conceive of no other form of living, moving beings other than themselves. When Igon brought back reports and pictures of the Bors and other creatures of Dark Land his life was sought because of his bold blasphemy."

"Those were primitive times, relatively speaking," remarked Nabah. "You are not likening yourself and your times to that situation, I trust?"

"Regardless of the relative states of Wisdom between Igon's day and my own, the creatures of Dark Land are still looked upon with holy revulsion and are not fit subjects for Seeking."

"Rightfully so," agreed Anot. "Seeking should be reserved for the higher things of life."

Ketan stared at the semicircle of faces about him. Respected Seekers! Why, they were little more than aged children in their confused and turbid thinking.

He ignored the illogical interruption. "I spent most of a *tara* in Dark Land some time ago. There, I encountered the Bors in their natural environment. And I discovered that what is true of the plants of Dark Land is also true of the animal creatures."

He waited a minute, a long pause while this sank into the minds of his judges. Then a bedlam erupted. Half the staid Councilors were on their feet shouting imprecations at him.

Hoult was forced to act. "Enough of this! Is it possible that the wild imaginings of a mere boy should arouse the Council to such indignity?"

To Ketan he turned. "A moment ago you roused our interest in your work. Now, you move me to put the judgment to the Council at once. You are not capable of pursuing a career of Seeking further—stating that the animals of Dark Land are grown from seeds that are embedded in the ground."

"I did not say that. I stated that the same principle that applies to plants applies also to animals. In this instance the ovule that grows into a new creation does not require

embedding in the ground. Rather, it remains inside the body of one of the animals—the woman animal if we may so term it—and grows to a certain degree of maturity there before separating itself."

Anot rose dramatically. "From the days of the great Igon down to the present, men have gone into Dark Land, studied minutely the things which the God has placed there, and hundreds of pictures of Bors have been brought back. All of them showed animals of a uniform size. Yet now we are asked to believe that Bors exist so small as to be able to be contained in the body of another Bors. I, for one, have had enough of this drivel. It appears that Leader Hoult is correct in calling for judgment of the Council."

He sat down amid nods of approval. Ketan looked about the semicircle with pity in his glance. Then without a sound he turned and went to the huge air-conditioned cage of the Bors, which had been rolled in behind him.

He adjusted the controls that caused it to roll slowly towards the space in the center of the Council and put a plane of three-quarters polarized vibration in front of the animals.

There was no sound for a moment until the largest Bors emitted a bellow that echoed like thunder in the great hall.

"Servicemen!" Leader Hoult shrieked.

Varano and his companion came running from out of nowhere. They seized him by the arms and held him stiffly.

"Before you order me out," advised Ketan, "look within—closely."

Involuntarily, the group let their fearful glances stray into the depths of the cage. One by one they saw it, and were transfixed.

The baby Bors nosed out from under the larger animal and sniffed at the front of the cage, blind to the gaping Seekers who were nearly invisible behind the polarized shield.

Leader Hoult sank back in his seat with almost real amazement on his face. "This is an astounding thing you have shown us—but of course it does not prove your contention regarding the origin of the animal."

"Can you wait any longer for proof that he is worthy of declassing?" shouted Nabah. "He has violated the ban of Kronweld against bringing creatures of Dark Land here."

"Yes, there is that, too—" Leader Hoult murmured. Ketan looked into his eyes and sensed that the man was turning over in his mind the possibilities offered now by this new outrage against society.

Ketan shrugged free of the grip of the Servicemen. "Leave me alone for half a *tara* with the two larger Bors and I will prove my discovery to you. At the end of that time I will show you three Bors."

Cries of "No!" arose. It started with Nabah, who cried out, "This man is too dangerous to remain in Kronweld."

Deep within them, four or five of

the Councilors felt a tug of the ancient spirit of Seeking which had moved genius in past ages to defy barriers of the God and of man to probe the secrets of Kronweld and Fire Land and Dark Land.

But the surge was weak and these remained silent under the smothering weight of decades of tradition.

"We canot permit such an experiment, Ketan," Hoult spoke almost benevolently now. "The very presence of the Bors is in defiance of our holy bans. This alone is more than enough to declass you. It is unthinkable that we could countenance your further Seeking along these lines, however, in consideration of your work on plants I am moved to suggest mercy to the extent of—"

"I'm not asking for your mercy!" Ketan flared. "I'm asking for the application of Wisdom, which appears to be a rare occurrence in this hall."

He halted, awed by his own foolish rashness, then rushed on. "If the Bors are a defiance of the whimsies of the old men of Kronweld, then away with the Bors. I challenge you to let me prove what I have found in a way that no man can deny."

"And how is that?" Leader Hoult asked coldly.

"Human beings can demonstrate the truth of my findings as well as can Bors."

There was a terrible silence in the hall. The only sound was the muffled snorting of the small Bors. Then Leader Hoult spoke softly—softly with acid menace.

"What was that you said, Ketan?"

"Allow me to complete my work and become a Seeker. It has been agreed that I and the Seeker Elta will make our companionship at that time.

"We will show you then the origin of human life and wipe away the fog and blind superstition that clouds this Mystery—we will point the way to the destruction of the Temple of Birth and make common its Mysteries among all men of Kronweld."

"I think you had better say more." Leader Hoult's words were deliberately carved of ice and chipped off one at a time.

"The interior of the bodies of men and women contain mechanisms similar to those I have shown you in the plants—and similar to those of the Bors. As with the Bors, the ovules which create human life are carried within the interior of the woman being until the young creation is separated from her. That is how you and I, respected Seekers, came into being!"

There was no outcry, no shouts of condemnation, no shrinking from blasphemy.

The feelings of the men and women on the Seekers Council went to infinite depths below such expression. They merely sat and stared in dumb horror at Ketan.

"How do you know what is in the interior of the human body?" Leader Hoult inquired in level tones.

Then Nabah was on his feet,

shouting again. "He has dared desecrate a human form by cutting into it. Our only obligation is death for this man!"

"I have no need to cut," replied Ketan. "I have a machine with which I can see into the depths of flesh and bone. I have mapped and drawn the entire mechanisms of the human body. They are intricate beyond belief."

Suddenly one of the Councilors was very sick. He left his seat and hurried away. A Serviceman approached to clean up.

Those adjacent moved away, but one of them stared straight in front of him and spoke in a hoarse whisper. "Who in all Kronweld since the God first placed man here has conceived a more monstrous thought?

"Imagine walking along the streets of the city and encountering another human being—and knowing that you had once been inside that body?"

He, too, became sick and hurried away.

VIII.

The Seekers Council confiscated the plants and the Bors and all the evidence and exhibits Ketan had brought with him, the result of long *tara* of work.

Serviceman Varano was detailed to accompany Ketan back to his house. The place seemed as empty as his heart. The two of them entered silently.

The Council had refused to return judgment in his presence, which in itself was a strange aberration of their normal procedure. Ketan wondered what reason lay behind this. Elta's pleading warning came back to him, "Hoult will not let you live!"

The desire to live, to fight again, was dimmed. He had failed. He had failed miserably. He had tried to blast ages of untruth with a single explosion. Elta had been right. He should have done it slowly, a factor at a time. He saw that now. If he had stopped with his description of the plant reproduction, they would have accepted that much of his claims. He had been a blind, impetuous fool.

He wondered what was left now.

He didn't have to wonder. There was only one thing. He didn't intend to spend the rest of his life as a Serviceman in Kronweld, even if the Council should be content with mere declassing. If Hoult should try to kill him, he would not die without fighting, even if the impulse was low at this time.

He would carry out the plan that Elta had urged upon him, the plan they had dreamed over and worked out long ago, when it seemed a pleasantly wild and romantic thing to exile themselves in Dark Land and there work out their forbidden Mysteries, to build up a renegade community of free Seekers in Dark Land.

This was all that was left.

He turned to Varano as they entered the house. "You heard the proceedings, what do you think?"

"I am not permitted to speak of the matter."

"Come," Ketan snorted irritably. "Last night we spoke as equals and co-operators. Has anything changed since then?"

Varano hesitated, gazing into Ketan's eyes with wistful admiration. "All right then—you're a genius and a fool. That's what I think."

"I doubt the first, but I'm beginning to agree with you about the second. Yet—how is this revolution going to be brought about?"

He turned towards the distant Temple of Birth lying at the base of the curtain of night that spread to infinity. "The symbol of all that impedes Seeking. And it will destroy Kronweld if it is not first destroyed. How can it be done? Women go blindly into that unholy place. Then spend their lives there as breeding vessels. That's where the inhabitants of Kronweld come from. Why do they try to hide it from us? Who is it in there that controls Kronweld in this manner? Is there no one among all our Seekers who knows the truth?"

"If I recall your statements," said Varano, "you said it required both the man animal and the woman animal among the Bors to produce a new creation, and that this was true also of human beings. If so, why is it that only women go into the Temple of Birth?"

"I don't know," Ketan admitted. "In all our history there is no record of a man ever entering into it. Perhaps some Seeker in there has found a way to make that unnecessary. It is not inconceivable that this could be done. It is one of the unknown mysteries of the matter.

"But I'll prove it to them yet! Varano, if you believe what you said, then help me."

"What can I do?"

"I'm going to leave Kronweld. I'm going to take Elta and we'll exile ourselves in Dark Land. We'll produce a new creation of human life and bring it back to show the ignorant fools on the Seekers Council."

"You wouldn't dare!"

"Yes—I would. Elta wanted to do it before the hearing. I should have listened to her then. We will dare to do it, all right. Which is better: To live in the freedom of exile, or to live a mere existence barren of Wisdom and Seeking as—"

"—as I do," Varano finished for him.

"I didn't say that, but—"

"It's the only thing you could mean. But I'll answer you. It was right for me to become a Serviceman. I never had the imagination or gift for Seeking that you have. In your case—well, sometimes I wish that we had met long ago, before I was declassed. Things might have been different—for both of us. For me, it is over. For you, I would say go ahead. Prove to all Kronweld, if you can, that the Council is wrong. They will kill you for it, probably, but in the *tara* to come, men may hail you as they now hail Igon."

"I don't want to be hailed. I only want to prove I'm right and find the secrets behind all these great Mysteries. But, if we es-

cape to Dark Land, I will need your help to get past the barrier that blocks the city from Fire Land. If you accompany us, that can be done. Later, you can testify that you were overpowered and forced to accompany us. Will you do it?"

"Yes," Varano said. "And perhaps when history records your achievements my name will not be forgotten as one who aided you in your work."

"Forget history," Ketan snapped. "It makes no difference if no one but the Bors of Dark Land remember us, as long as we accomplish our purpose. Now, there is much to be done."

"You have shields?"

"Only body. I'll need a shielded car in order to pass through Fire Land. Seeker Janu has one. I'll obtain his."

"He's not likely to grant permission."

"I'm not likely to ask for it," Ketan said grimly. "You must help me there, too. It won't be easy to steal such a car and get away quickly before an alarm is raised. Fortunately, such things don't happen often enough for the Council to plan for them."

Varano paled. "It's too dangerous. Theft is a terrible crime."

"Not half as terrible as some crimes that are being committed in Kronweld. Let's eat and refresh ourselves now. We'll detail our plans later.

The first globe was disappearing below the horizon. The half-light had begun to set in, and all the landscape took on the eerie, dimly lit aspect of a dream.

The inhabitants over the city were shedding their day cloaks at this time and going into the most active period of their day, unhampered by the heavy garments.

Ketan and Varano shed theirs as they stepped into the interior room. They washed and changed their brief harness wear and sat before the refreshment panel.

"Might as well have a last one," Ketan smiled grimly as he pressed the secret combination that produced a thick Bors steak. "The Director of Food Center would collapse if he knew this came out of one of his newest regulation panels."

"How do you do it?"

"Tapped the regular channels and put a lead from my own automatic kitchen."

After the meal Ketan began his extensive preparations for the trip to exile. He gathered the equipment and materials it would be possible to take with him. These were meager. The remainder of the pile he gathered was provisions and supplies for personal needs. All his notes and Seeking materials that he did not take he stored in proper places where Branen would find them easily.

"I must go to Elta now," he announced to Varano. "You will grant permission?"

"Yes—but be careful. I think it would be best if I remained here in case some communication should come for me. Do not let yourself be detected while you're out. I

would have to join you in exile if they found I had let you out."

"That might not be a bad idea at that."

Varano looked serious, but said nothing.

Ketan stepped to the plate and ordered a connection with Elta's house. He waited long and impatiently while the signal sounded and the response indicated endlessly that she was not there. She had left no indication of her whereabouts for prospective callers.

Ketan cut off. She was always there at this time. He wondered where she could have gone.

He tried the headquarters of the Seekers Group, a social organization. She was not there. Nor was she at the House of Wisdom or any of its units. He then had her called at the entertainment centers and there was still no response.

Worry began to edge into his mind and displace rationality. "Something must have happened. A person just doesn't totally disappear from all her usual locations."

"She could be working with some other Seeker at his house until this time," offered Varano.

"She would have left some word for callers."

"You can't be sure of that."

"But I've got to find her. The time is growing short. I'll take the car and go look."

"You can't do more than you have already. Besides, you're liable to be caught if you just cruise around purposelessly."

"I'll go to her house and keep you in touch with every place I go. If anyone calls for me here, tell them I'm not able to see anyone—after today's ordeal."

He went out into the night and Varano heard the soft whine of the atomic powered car fade in the distance.

As Ketan drove away, new fears began to froth within him. He remembered Elta's previous words: "I must go away for a little while." And: "This will be the end of the life we've known— Go into Dark Land—Wait for me there—"

What had she meant? Had she actually conceived some mad plan and already carried it out?

There was little danger of encountering anyone who would report him. Only the Seekers Council and the First Group and the two Servicemen knew he was confined to his house. Even the presence of the Serviceman was a mere formality. For him to attempt escape was an unthinkable breach of custom.

Yet there was the vague possibility that Leader Hoult might not consider him above making such a breach after the hearing that had taken place.

He cruised along the streets boldly. The fading twilight was enhanced by the lines of activators above the streets that energized and made luminous a thin sheet of air itself. The city was day bright.

He passed into the more luxurious part of town where the full Seekers lived.

Elta disliked living alone in a

house of her own and had moved into one of the four unit combines where quarters were shared with three other Seekers.

Ketan stopped before the beautifully gardened plot and raced to the opening between the marble colonnades. The pale-green walls were restful to his eyes as he sought the third compartment which was Elta's.

He pressed the signal expecting as always, an instant response. A cold numbness flooded over him as he stared at the response which came. A flashing card lighted momentarily.

"Uninhabited," it read.

Ketan pushed wildly on the signal. Again came the response as before. He pushed the door open and stared within. He could not believe the emptiness he beheld. He opened drawers and cabinets and examined the shelves. Not an item of Elta's possessions remained. She had vanished utterly from the place.

All the mad enthusiasm for the wild escape into Dark Land drained out of him. The ambition that had driven him on to defiance of the Seekers Council suddenly seemed dim and lifeless without Elta.

Where could she have gone?

Then he began to order in his mind the catalogue of possible happenings. A person could not simply vanish into the air. She had to be *some place*, and Kronweld, from one boundary to the other, was not large. He'd search it from one end to the other if need be.

Then he remembered he was a fugitive and his hopes crumbled again.

He strode out of the room and closed the door softly behind him. He went to the door of the adjacent compartment and pressed the signal. The entrance response invited him in.

Two women were in the room. Seekers whom he knew slightly, only by sight. He knew he was a stranger to them.

"Respect to you," he said. "I'm looking for the Seeker Elta. I expected to find her home, and now I see her compartment is uninhabited. Can you tell me where she went?"

One of them rose, a tall willowy woman.

"You must be Ketan," she smiled. "Elta spoke often about you."

She surveyed him intimately for a moment. "Now I know Elta is even a bigger fool than we thought when she left this morning. But don't tell me you don't know where she went!"

The woman's gaze irritated him. "I wouldn't ask if I knew," he said.

"She has left for the Preparation Center. Tomorrow she enters the Temple of Birth to become a Lady of the Temple."

IX.

The silence when the woman stopped speaking was terrifying. Ketan felt it was palpable, crushing in upon him like a vise.

He spoke in a dead monotone. "You are sure of that?"

The woman nodded. "I saw her application acceptance and her orders to appear this morning. But don't act as if you'd just been declassed. There are still women in Kronweld—Seekers who might be very companionable. Won't you come in and sit down? Try some of the new refreshments that the Food Center has put on only tonight."

"No . . . no . . . respect to you," Ketan turned mechanically and went into the hall. "I must go. Wisdom."

He hurried into the night.

The numb shock of the news dulled all but the senses necessary to drive the car through the streets, and he drove aimlessly for a time he could not measure.

This could not be what Elta had meant when she told him she was going away and would return to him soon. There was no returning from the Temple of Birth—ever.

While he drove, his mind began to function slowly again. The flight into Dark Land was in vain, now. There must be other plans.

He drove far, around the entire circuit of the city, and when he had completed, his new plans were focused solidly in his mind. He found himself on the wide, scenic roadway that passed before the Temple of Birth. He was almost in the same spot that he and Elta had stood when the Servicemen accosted him.

He stopped there and gazed upon the Temple of Birth. The smaller building of Preparation Center, which was outside the purple line, was an ordinary building of the city, except that there was only a single sealed entrance in its cubical hulk. All the other walls were perfectly blank.

Somewhere within those walls Elta was going through unholy rites known only to the God himself.

Ketan knew what he must do.

And once he had come to a decision, a curious, frightening clarity came over his mind. He saw that this was what he would have done in any event. He had chosen—been guided in choosing—the only step for which he had been ordained from the moment he had emerged from the Temple of Birth twelve *Tara* before. All other plans would have failed regardless of his efforts.

As this thought came to him, he seemed to hear a voice but he wasn't sure. He thought it said, "That is correct. Hasten, Lonely One."

Varano was pacing about the room in soaring anxiety as Ketan returned.

"I thought you'd never come. That fool Nelav, my superior, was here twice. I—"

Then he saw Ketan's face. "What did you find?"

Ketan told him of Elta's action. Varano was disconsolate, but resigned. "That about ends it, I guess."

Ketan surveyed the Serviceman at close range for a long moment then drew back his fist in a lightning movement and felled Varano with a single blow on the jaw.

"Respect to you," he murmured as the Serviceman crumpled at his

feet. "But I'm afraid your conditioning has been too deeply embedded for me to ask for your help from here out."

He hoisted the limp form on his shoulders, then made his way through the hall past his above-ground laboratories and down the steep, seemingly endless flight of steps into the depths under the house.

He took the Serviceman into one of the spotless workrooms where he had patiently solved the problem of the creation of the Bors and lay Varano on a table. He examined the man's breathing closely, then he selected an injector and filled it from a colorless bottle. He pumped the substance into Varano's veins.

After a moment the Serviceman became still and almost lifeless. His breathing slowed until it was nearly undetectable and his heart movements came farther and farther apart. At last they steadied until there was no more slowing. Ketan was satisfied.

Varano would sleep for at least thirty days.

This work was not the result of Ketan's own Seeking. It belonged to Branen and another member of the Unregistereds who had worked it out in conjunction with Ketan's work on the Bors.

They had made only a small beginning in understanding the functions of the bodily mechanisms and Ketan hesitated to use the chemical on Varano. But there was no other solution. He believed it was safe.

In the silent room he considered contacting Branen and conferring further now that it was certain that he would have to assume Ketan's leadership of the Unregistereds. But there was little he could hope to accomplish. Branen would have to do the best he could from here on. Ketan hoped he had enough imagination to keep the organization of the Unregistereds from falling apart while he was gone—and longer if he failed to come back.

He wrote Branen a letter explaining Varano's presence and instructed him to put the Serviceman in a deserted public place at the end of the thirty days that he might regain consciousness outside Ketan's home.

This he put with the notes and instructions he was leaving concerning his work and the organization of the Unregistereds.

For making enlarged models of his plants for study, Ketan had a large quantity of elastic molding plastine. He selected a mass of the whitish stuff and mixed it rapidly with a light cream and rose pigment.

When he was satisfied with the result he stripped off his harness and began applying the stuff to his body, slowly remolding his contours and pigmenting his body from head to foot.

The result was almost shocking to him as he viewed himself in the metallic mirror. He made a credible appearing woman; necessarily plump in order to smooth out his muscles, but satisfactory.

The sculptoring was a long and tedious job. His muscles ached

with the strain of his contortions when he was through, but he felt the job would pass the inspection of the first woman herself.

He had no harness or light night cloak of the exact type that was worn by women, but the difference in style was slight and he would have to take that much chance.

Ketan climbed the long flight of stairs gingerly. The molding on his body felt as if it would peel loose at any moment. But he knew it was merely an illusion. Nearly boiling water was required to remove it, and then only when it had been partially dissolved in a special solvent.

He was thankful that its porous, minutely spongy nature made it possible for him to perspire or it would have been unendurable in the amount of skin area he had covered with it.

From the remains of the possessions he had gathered for the flight to Dark Land he selected only a powerful harpoon and length of fine cord which he had used as a weapon.

He sealed the opening to the secret laboratory so that no one who did not know the combination to the entrance could ever gain access to it. He darkened the rest of the house then and went out with the harpoon in his possession.

He did not use the car but started afoot in a long easy lope that carried him swiftly over the cast surface of the road.

There were few others about. He slowed when he passed anyone, so as to not attract attention, and ran on when he could not be observed.

He was breathing heavily when he came to the circling road that passed in front of the Temple of Birth. For a moment he paused to catch his breath while he surveyed

the exterior of the Preparation Center.

The squat, three-level building was utterly dead to all outside appearances. The single door that served it would open only to one of the secret combinations that would identify the caller as one who had received her admission orders carrying her particular unique code.

Somewhere within that building was Elta.

The thought repeated itself over and over in his brain.

The building stood alone. The lighting from nearby activators was dim and fairly dark shadows lay at the rear of the structure where only the pulsing reflections of the sky lit it.

He glanced cautiously in all directions then walked boldly towards the building.

On a line with the rear wall, he suddenly darted into the protecting half darkness of its shadow. He paused, listening and watching. Satisfied he was unobserved, he unslung the small harpoon and attached the line with its grapple head. He raised and fired a silent shot.

Up into the air the grapple sped, snaking the line behind it, and fell over the edge of the roof. Ketan pulled it taut, then tested it with his full weight. It held.

He braced his feet firmly against the wall and began climbing, inching his way to the top. He was desperately handicapped by the smallness of the line. It cut and sliced into the palms of his hands, but he continued the steady advance.

At the top he finally grasped the edge and drew himself over. He lay a moment flat against the roof after drawing up the line and depositing it in a corner.

He glanced around and saw what he had hoped for.

The roof, in common with all others in Kronweld, formed a place for refreshing and sun-ray exposure. There was an entrance from the roof to the interior of the building. He was counting on this being open. Seldom was such a place locked.

This one was.

It was hopeless to try to break through the door whose electric lock made the wall and door as a solid mass of metal. He glanced in momentary despair about the rest of the roof. There was nothing but the usual tables and chairs and lounges and a semi-covered refreshment panel with a capacity of about twenty, he noted.

There was no way in from here short of blasting a hole in the thick stone and metal structure of the building.

The only other alternative was to wait, hoping that someone would open the door from the inside and come out on the roof before it was too late to do him any good. He recognized the more than probable chance that a group of persons would come out at once, making his quest hopeless.

He sat down beside the low wall. Above, the violet lights flickered and surged. Occasionally for brief

moments of darkness, he could glimpse the pinpoints of light in the sky that hung mysteriously over Kronweld. Another of the great Mysteries that man had never solved. And the Seekers Council said man knew almost everything there was to know!

The unhurried time passed slowly. He dozed once and roused in alarm at a sudden sound in the street below, but it was not repeated. His fingers moved over the compartments of his harness, idly checking the small kit he had filled before leaving the laboratory beneath his house. It still contained the filled injector and repair materials for his disguise.

Dawn began to slowly tinge the eastern fringe of the sky. The first globe would rise soon. He wondered desperately what to do. It would be too dangerous to try to get down the way he had come up if he waited much longer. If he were caught here, he didn't know what would happen to him—in addition to the sentence that had by now been passed on him for his blasphemy.

There was no precedent for the crime he was committing now.

A sudden slight sound at the doorway roused the full alertness of his senses. He leaped to his feet and flattened himself against the wall. The door opened quickly for all its ponderous mass. A young woman came out and stood still a moment, watching the lighting sky.

Ketan noted that she was alone, and with further gratefulness he observed that she was only a little less than his height and blessed with plumpness that was not quite as ungainly as his own hurried sculptoring, but was ample. Her hair, too, was trimmed not so differently from his own.

He paused and watched her. She stood face to the rising sun, hair brushed back by the early morning breeze. A thin, white, glistening robe covered her in addition to the common harness wear. He guessed it was some sort of ceremonial garb.

She turned with a start as he stepped away from the wall. "You frightened me. I thought I was the first here this morning," she said. "Isn't the sky beautiful up here in the morning? I wonder if we'll ever see it again afterwards?"

Ketan stepped forward smiling and put his hands quickly about her throat. "Make no sound," he said in passable falsetto. "You will not have to worry about the view of sunrise from the Temple of Birth. You are not going there."

The girl's eyes went wide in sudden fear. She saw he was not one of those who belonged at Preparation Center. "Who are you?" she choked out.

"I hope you never find out. Out of your clothes, quickly now. I must exchange with you."

She trembled even more fearfully. "No! These are my induction robes. I must wear them today to the Temple of Birth."

"That's why I want them," Ketan said grimly. He loosed one hand and tore the fastening loose at her throat and removed her robe. She

struggled frantically until he carried her to the corner where he had left the harpoon and line. He bound her hands and gagged her mouth with the corner of the cloak. Then he swiftly exchanged clothing.

When he was through, he freed the bonds and fastened a loop in the end of the line to fit her foot.

"What are you going to do?" she cried.

"Nothing that will harm you." He seized her tightly and drew out the injector which he had transferred to the stolen harness. She had never seen such an instrument, but something of Ketan's manner suggested its purpose and she cried out in terror.

He plunged the point into her arm and emptied it.

"Now, put your foot in this loop and hang onto the line. I will lower you over the edge to the ground." He spoke with a threatening hand on her throat.

"No!" she cried in sudden shame. "I have taken my vows. I must go into the Temple. I can never again live in Kronweld. I would be shunned as a Bors walking in the streets. Let me go!"

"As soon as you are on the ground you can find the nearest Serviceman and tell him what I have done. You will be freed of blame and can enter the next *tara* into the Temple, perhaps."

"They'll kill you!"

"Perhaps. Now quickly—"

He dropped her to the edge and pushed threateningly. She grasped the line and fit it to her foot in self-preservation. Then he lowered her swiftly down. She stood a moment looking up in bitter hatred and fear, but Ketan was gone and the line flicked up to the roof again.

As he went back to the door he caught a glimpse of her racing fleetly down the street. He hoped she was not too good a runner. She might even reach a Serviceman and tell her story yet.

But as he watched she slowed and grasped at her heart as if in sudden pain, then fell headlong.

She would awaken a half day later than Varano.

X.

From his kit he mixed a color preparation to match the girl's hair and sprayed it into his own. He clipped it as nearly as possible to resemble hers—a low point at the nape of his neck, tapering to shorter length at his temples.

He darkened his eyebrows and applied a thin ridge of plastic to his nose to lessen its apparent width. The girl had a thin, finely shaped nose and Ketan was disgusted with his attempts at imitation. It would have taken a good sculptor many days to duplicate her finely molded features.

But it would have to do. He replaced his materials and fastened the compact kit to the glistening white and gold harness that cinched him tightly under the thin robe. It was adjusted to the maximum size, but the girl's seeming plumpness had been somewhat deceptive, he found.

There were two things he could not change. Those were his voice and the color of his eyes. He'd have to take a chance.

He strode to the door and pushed it open.

The short flight of steps led into a long, thickly carpeted corridor. Soft, creamy lighting was present in the energized air. Its impact made a restful sensation on the skin.

Doors lined both sides of the hallway. He stood there in a momentary hesitation about where he should go. He had to learn something about the customs of the place or they would make short work of discovering his deception.

A door behind him opened suddenly and a white-robed girl hurried out. "Come quickly," she said. "It's nearly time for the assembly. We'll be late."

Ketan nodded and smiled and hurried along beside her. This was fortunate. He wondered what the assembly was.

They turned a corner and passed through wide gold doors and found themselves at the rear of a small chamber in which about thirty young women were gathered in a semicircle about a small central platform.

All were gowned in immaculate white robes. The expression on their faces was rapturous. The gathering made a solemn and sacred impression. It almost inspired in him a twinge of conscience at desecrating such a place.

But his remorse was short lived. He knew that all this was but trimmings to ignorant belief in false gods. The sooner it was torn asunder and truth restored the better for all—including the young women present.

He took a seat beside the girl he had met in the hall. His disguise gave him a moment of panicky self-confidence in which he imagined everyone there was looking at him and knew his sex.

He fought it down.

An older woman emerged from behind curtains and mounted the low platform. She was magnificent in thick gold robes and a crowning helmet that gleamed with white and purple stones. She glanced around amid the instant quiet.

"Ladies of the Temple—for that is now your rightful title," she said, "you are this day no longer women of Kronweld. You belong to a new and larger world, for which you have forsaken forever, the old. You belong to the world of the infinite, a world that lies on the very threshold of the realm of the God."

Ketan squirmed. He wished she would say some words that had meaning. But the girl next to him was ecstatic. He wondered if he were missing something of significance.

But his mind refused to concentrate on the speaker's words. Only one thought had pounded within him since he had entered the room. Where was Elta?

Without attracting attention, he tried to crane his neck and get a glimpse of her. This would be a bitter farce if he didn't find her.

She was sitting two rows in front

of him. Her eyes were intent upon the speaker. She was drinking in every word that was spoken.

The whole mystery of everything that had happened since the night of his rendezvous at the *Karildex* with the shriveled old woman burst upon him anew in an overwhelming wave.

Question after question assailed him, for which there were no answers. Foremost: Why had Elta come here? Was this the thing she had referred to when she had told him she was going away? It seemed impossible that she had plans to come back from the Temple.

Whether she did or not, there would be no turning back for him now until he had found the last secret of the unholy place.

He wondered if the old woman had sought him at the *Karildex* again. Would he ever see her again?

He tried to turn his attention back to the woman on the platform.

"You are to preside at the creation of man," she was saying. "To no greater task could you have dedicated your lives. The work of the First Group and the Seekers Council in Kronweld is small beside ours."

Suddenly a new and strange fear grasped Ketan. The woman *meant* what she said.

It took him a moment to grasp the full significance of that. He fought down the fear and told himself his discoveries couldn't be wrong. He had the evidence of the Bors and of his own charts of the interior of the human body. He couldn't be wrong.

Yet how could anyone as close to the charlatanism as she was speak as she was speaking. It was different with the members of the Seekers Council. They didn't have any real knowledge of the Mystery. But she must *know*—

He listened abstractedly to her long eulogy of the life of a Lady of the Temple. There was nothing in it that gave him a clue. Her only concrete directions were that they were to be ready to march to the Temple at the rising of the second sun when the building would have its once in a *tara* opening.

They were dismissed and went out from the room. Ketan wound among the small groups that coalesced in knots of conversation and sought Elta. She was not joining any of the groups either, and hurried away. He caught up with her and spoke urgently. "May I see you alone—?"

She turned. The nearness of her brought a tightness to his throat. "Of course, Murna—" Her hand went to her throat. "You're not Murna— Who are you? I've never seen you here before!"

"Please," he said urgently, "in your room?"

Doubtfully, she turned and led the way. He looked back, but no one was following them. Then they were inside the room and he closed the door. He approached closer to her. She backed in half fright.

"Look closely, Elta." His voice lowered to its masculine pitch. "Do you see nothing in me that you recognize?"

Her eyes widened in horror. "Ketan—!"

"I had to come after you, Elta. Why have you done this insane thing?"

"Me!" she gave a short despairing laugh. "What about you? How did you get in here? What do you intend to do? Don't you know that if they found you here, killing would be mild to what they would do to you? That's merely the penalty for one of the girls if she leaves after taking the vows and receiving her instructions."

"So that's the kind of discipline that's necessary here. It must be a benign place. I'm going to expose its corruption to all Kronweld."

"Oh, you fool, you fool—" Elta sank wearily on the bed. "You don't *know* anything about this place.

"Why wouldn't you trust me, Ketan? I told you I'd come back to you and we'd go into Dark Land. Now—"

"Back? From here? Is this where you intended to go all the time?"

She nodded, her head bowed.

"Why?"

"I can't tell you that."

A barrier as black and as forbidding and as infinite as the Edge seemed to have risen between them. There was nothing Ketan could think of to say in the face of its widening separation of them. Elta seemed for a moment like an utter stranger. She could not be the Seeker Elta whom he had loved—with whom he would make their companionship.

"Now—?" he said.

A low, bitter sob escaped her. "Now . . . now, there is nothing. You are declassed . . . and the God only knows what more for coming here. Hoult would have killed you in Kronweld. Now he has a double excuse if you go back. They will hunt us down, even in Dark Land—

"But that is the only solution. Escape and go there. Tell me how you got in here—we'll go now, both of us. We can make it. We'll leave all this behind us and forget it for the rest of our lives—if they'll let us. You know Dark Land. Surely we can find hiding there where they can never find us."

Her eyes were upturned towards him, earnest, pleading. He shook his head.

"It wouldn't be worth it. Even if we succeeded we would condemn ourselves to lives of perpetual fear and running from those we feared to fight.

"I think there are other lands besides Dark Land and Fire Land, which no man has seen. I think that somewhere beyond them is the land of my vision, where a tall, thin pinnacle rises in a desert of red and white drifting sands. I think even that you may know where that land is. But regardless—that's where we're going. I believe the secret of its location is in this Temple."

He had no reason for this last

statement except the complete sense of clarity and correctness which flowed over him ever since he had first made the decision to enter the Temple. It was as if he were being drawn along by an invisible wire that signaled when he was making a wrong or a right move.

"I must find that pinnacle," he said, "and you shall go with me."

But Elta's eyes widened as they had the first time he mentioned it. *"You must not find it,"* she said in a voice of terror.

Ketan gazed long and steadily upon her. "You know what is there. You know where that pinnacle is."

"No! If I did I would have destroyed it long ago. I only know of the terrible things it is said to hold. Trust me—if you won't take me with you into Dark Land. Go without me. Soon I will come to you and then I promise that never will we have to live in fear again. The Temple will be destroyed, even as you wish. Then I will tell you all you want to know about me."

"I don't know how you know of these things, Elta, but if they are as fearful as you would have me believe I cannot wait for you to choose a time to tell me. I must know them now. I must find them out for myself." He shook his head slowly. "It is not I who does not trust you—you do not trust me enough to tell me what you know of the pinnacle—how you know of a thing I have only seen in vision. Tell me what you know of the old woman who came to me at the *Karildex,* why Leader Hoult would kill me if he had the chance. What is the mystery of him and Teacher Daran—and of Elta?"

She remained silent, head bowed, and unmoving.

At the opening of the Temple of Birth every inhabitant of Kronweld, without exception, gathered in the semicircle surrounding the white marble building. The guarding line of atomic devastation was broken down and armed guards were posted before the single entrance to the Temple.

Ketan remembered well the day of his own emergence. For the first time he saw the outer world and the glowing twin globes shining from the cloud-hazy sky. Somehow, he had known that it would be as it was, but still the impact of the terrible reality of the exterior world had been a physical blow.

That had been twelve *tara* before. Since that day he had been able to remember absolutely nothing that preceded his entry into Kronweld.

Yet, deep below the conscious level in his mind was the conviction that there had been something *before*—that he had not simply sprung into existence three quarters grown as he emerged from the Temple. Something had been done to block off the things he was not meant to remember.

He recalled the things that he knew that day when he stepped out into the air and sunlight of the natural world. He knew the language. He knew the fundamentals of Seeking. He knew what kind

of a society he would find himself in. He knew that he would be assigned to a house of his own as a primary learner and advance until he became a full Seeker, if he could.

That much he knew, but of the means by which he knew these things he could recall nothing.

He remembered no part of the interior of the Temple beyond that moment when he stepped through its portal. He wondered now if any of the surroundings would strike a note of familiarity within him.

The atmosphere in Preparation Center was tense. It infiltrated even into Ketan. But he had a far greater reason for anxiety than any of the girls. He felt certain that discovery would mean swift death. Surging beneath the surface of Kronweld were strange, unknown forces of which he had never conceived. Forces that were merciless and swift.

And somehow Elta was ensnared in their midst. He felt it was his destiny to destroy those forces—which loomed now even larger and more deadly than his original problem of overthrowing the system of registration for Mysteries.

A sudden, resounding blast of instruments was heard, penetrating even the thick walls of the Center. There was a flurry among the newly inducted Ladies, and Ketan found himself beside Elta in a double line before the great doors of the Center.

The chief Lady of the Center was at the head of the column, crowned with the splendor of her golden robes.

Slowly the massive doors swung outward. There was a great hush, oppressive in its solemnity, as the column began its slow march into the daylight.

There was a wide lane leading directly from the Center to the still closed door of the Temple. Lining each side were the thousands of inhabitants of Kronweld, heads bowed in reverence before the Ladies whose very footsteps had become holy by their consecration.

Ketan felt suddenly and utterly naked. The impact of mass reverence convinced him momentarily of the fiendishness of his deception. He felt a wild urge to break and run through the vast crowd.

And there was a pounding fear in his heart lest someone look closely and recognize some familiar feature in his face. He kept his eyes averted downward, looking steadily at the heels of the woman in front of him. Elta, at his side, gripped his hand once in a gesture of tender despair.

The music softly flowing from the Temple grew louder as they approached the long broad flight of steps leading upward. At the top, the double column separated, half moving to each side of the steps, and halted there.

A thunderous blast from unseen trumpeters split the air. Then silence.

Slowly and ponderously, reluctant to break their seal upon the Temple, the massive, golden doors parted.

Ketan remembered that moment twelve *tara* before. That first crack of daylight was like a revelation from the God. Now he saw unnumbered other new inhabitants waiting impatiently, fearfully, beyond those doors. He saw the look of terror that crossed their faces, then they began to move tremblingly into the light of the twin suns.

He watched them pass between the lines of waiting Ladies. There was a terrible bravery about that moment and an intense sympathy went out from him.

They took only a few moments to pass. With an involuntary gasp, Ketan looked up through the doors. The dark hall was empty. There were no more to come out.

He looked back at the receding column. There were not more than two hundred and fifty of them.

His own gasp was re-echoed by the low murmur that began to swell from the watching group. It was a murmur of despair and wonder. Only two hundred and fifty—

Each *tara* the groups emerging seemed to become smaller and smaller, but this was the smallest of all.

Where would the reduction end? Why were there not more? No man in Kronweld knew the answers.

Now, the twin lines of the waiting Ladies turned and advanced. They converged at point in the center of the broad doorway. The doors closed.

Ketan had returned to the Temple of Birth.

XI.

Amid silence except for the padding of their soft shoes on the marble floor, they wound slowly down a long, curving corridor whose side was shaped by the rotundity of the outer wall.

The corridor led into a small chamber heavily rugged with maroon carpet. Faint strains of music issued from unseen sources.

"I leave you now," their leader said, "to your lives of service. Dedicate your every thought and desire to the performance of your duties well, for upon you rests the future of man. I leave you now to Matra, First Lady of the Temple of Birth. Learn from her—resolve, each of you, to be as great a Lady as she has been."

The golden robed Lady left the room. They sat in expectant silence.

Before them was a low platform with a dais in the center. Curtained alcoves marked either side.

There came a faint rustling of the curtains on the left, and then from between them emerged an old woman. Her silver hair was neatly bound with a jeweled band and her thin limbs were clad in white, shining robes.

She stood a moment glancing over their expectant faces as if with an intense hope and longing. Her eyes met Ketan's.

At that instant his world exploded.

She was the old crone who had come to the *Karildex* and told him he must slay Leader Hoult, Teacher

Daran, and Elta.

He felt a current of recognition pass between them. The corners of her mouth turned slightly in an enigmatic smile, and her glance passed on.

She knew him.

His breath came hard and damp perspiration oozed from his pores as a sense of entrappment flooded over him.

He scarcely heard her begin speaking.

"—eighty *tara* I have been here. I do not regret a day that I have lost from the outer world. My only regret is that I have not done my work well—none of us ever fulfill our dreams.

"You who once came forth from these sacred chambers must learn that it was here that the hopes and ideals and desires of the God who built Kronweld were planted within you. In turn, now you shall teach others as you were taught.

"You wonder what is required of you—you are new and hopeful, you are eager and fearful. You shall know every emotion that crosses a human breast, but sorrow and heartache you will bear in disproportionate amounts.

"It is your task first to learn the great things that have come down from the time of the first woman, and then to teach them to those who come unto us.

"All of you have wondered where life came from, how it is created. That is one of the forbidden Mysteries which Seekers in Kronweld have often been tempted to search out, but it is not wisdom that they should know. Even we who have been blessed to care for new life have not been given knowledge of how it is created. That knowledge is reserved only for the God. We see the performance of his works, but we do not comprehend how they are done.

"Tomorrow, after you have rested and refreshed yourselves, you shall witness the creation of life."

Fearful doubts began to flow through Ketan. Not a shred of evidence, not a clue to tell him that he was right. What if his beliefs and theories were a horrible blasphemy as the Council had judged?

He might never know. Matra's eyes roved over the assembled Ladies but ever they returned to him, boring into him as if trying to establish unspoken communication. Communication for what? He could not tell if her glance was one of condemnation or not.

Now a needle-sharp sadness came into her voice.

"I will not be with you long," she continued. "Perhaps you are the last group of new Ladies that I shall welcome into the Temple. If so, I give you my last command: You must do your work far better than your predecessors have done. Perhaps some of you may know it already; some of you may not. Kronweld is failing. Don't let that shock you. So slowly that you who have lived there your short lives may not have seen it Kronweld is retrograding, going into the past. No more are there great fearless Seekers like the mighty Igon who

was the last of the great ones.

"Why this is so, I do not know. Nor do I know why the creation of new life is less with each *tara* that passes. The group that I emerged with numbered over two thousand. You saw those who came forth today. You must find why this is so or Kronweld is doomed. I hope there may be one within this room who will find the reason for this.

"You may go now. An attendant for each of you is outside in the corridor. You will be shown to your rooms and tomorrow taken to the chamber of birth."

They arose, silent and somewhat shaken by the intensity of her almost inaudible speech.

Ketan turned with the group and sought the door. Elta, beside him, felt the tenseness of his body and looked inquiringly into his face.

He knew that he would not get to the door. Halfway there, he realized the ancient was speaking again. Someone plucked his sleeve and he turned.

"You who call yourself Murna—I would speak with you," Matra said.

He paused and turned. She was looking at him again with those eyes he knew could read his thoughts. Elta went on with the rest.

Then, for the first time the full realization of panic broke upon him. Matra must know that Elta was there in that room. And she had said that Elta must die.

He couldn't let her go out that door, out of his sight. Had she known that by coming to the Temple she was putting herself in the old woman's power?

There was nothing he could do. The others were beginning to look curiously at him as he stood in panic of indecision. He turned slowly and moved towards the platform with its low dais.

When they were all gone, Matra's eyes still surveyed him, boring beneath the disguise, stripping away the false plastic, baring his identity before her.

"I had not thought to see you again so soon, Ketan."

He stood still. The frozen air encased him in chill. Where had he blundered? She could not have recognized him unless she had known—

For a long instant he gazed steadily into her eyes. "I wanted to finish our conversation," he said. "You left—rather suddenly the other night."

She was taken aback momentarily. Then she smiled and shook her head. "You are lying. You did not know I was here. Tell me, why have you come?"

"I have come for the secret of life! You and all those like you have withheld the secret long enough. Man must have it, or he will die. When I have found that secret I shall destroy you and your Temple and all that it represents."

"That is good," she said. "I was sure that you had come that far. Come closer, and sit here beside me, and I will tell you what I failed to tell you before. I planned to come again to the *Karildex*. It is

better that you have come here.

"It will not be necessary for you to do what I ask. When I learned you were in Preparation Center, I gave your task to another."

"You mean—?"

"Daran is already dead. Hoult—by this time tomorrow."

Revulsion engulfed him in smothering nausea. A man killed—he had not realized what it meant before, even when Elta spoke of Hoult's intent on his life. In three hundred *tara* no man had been deliberately killed in Kronweld.

Elta.

"We shall take care of Elta here," the old woman was saying. "She—"

"Why, you—!" Ketan leaped up. His hands reached for the skinny wrinkled throat. "If you touch her, I'll—"

With amazing agility, Matra sprang away from his grasp. "You fool," she raged. "What can you do?" Then she calmed. "You did not come well prepared in case your disguise was penetrated, did you, Ketan?

"But don't worry. I know how you feel. Igon— But when you have heard my story, you will have a change of mind. Listen.

"Imagine another world surrounding us on all sides, a world of people like us who could see and know of us, yet couldn't be seen. A world of which we had absolutely no knowledge.

"Such a world actually exists, Ketan. It knows of us, has known of us for more than a hundred *tara*. All the results of our Seeking are taken to that world and used for the benefit of those who will eventually destroy us. We have been permitted to live only so long as we have useful knowledge to supply to this surrounding world. Now, there is only one thing they want, our knowledge of atomic forces. So far, they have not obtained it because their emissaries among us have not been able to understand or grasp it. They are of a very low intelligence, generally.

"But now, there has come one of them into Kronweld with intelligence sufficient to take even that knowledge back. Kronweld is about to be betrayed and destruction loosed upon us.

"That emissary is Elta."

The hypnotic rasping of the old woman's voice drilled itself into Ketan's mind and forged a place there that told him she was speaking the truth.

But the rest of his brain retched out the thought. Elta—! No—there was no part of him that could believe she was member of a mythical race from a mythical world that hovered over Kronweld with death and destruction.

"I do not believe you."

"No—of course you don't—yet. But I shall show you. I shall show you in a way that you can never disbelieve! Then you shall return to Kronweld like an avenging brand to root out the festering rot of destruction that hides there. I know you, Ketan. I have what it will take to convince you.

"Until you have seen, Elta shall be spared."

Quite surely, he knew that what she said was true. She did possess whatever facts would be needed to convince him of what she said.

He was aghast at the significance of it. A world about Kronweld, she said. An invisible, spying, destructive world. And this one lone withered husk of humanity the sole agent against it.

She turned upon him suddenly. "Go to your room now. At once. You will be shown your duties by your personal guide."

He turned. Behind him, a hard, sharp-faced woman had entered and eyed him disinterestedly.

"Pardon, Matra. I thought I had lost my student."

"It is quite all right. Murna stopped to ask a question. I am pleased with her. She is earnest."

Ketan turned and followed the frozen-faced guide out the door. He looked back once, but Matra had vanished.

They turned from the large corridor into a smaller, coolly lighted passageway lined with doors. They halted before one.

"This will be yours—for the rest of your life." There was a half gloating in the woman's voice.

They entered and she indicated a closet where a supply of robes and harness were stored. "You may remove your induction robes. You'll never need them again. Most of the Ladies keep them stored for sentiment. Here are your robes for relaxing—and here are those for duty in training, for watching, and for teaching. Make yourself acquainted with the rooms.

"My name is Nelan. I'll call for you tomorrow when it is time for you to go to the chamber of birth."

She paused with her hand on the door and turned back. "What was it you asked Matra?"

Ketan turned sharply to the impudent guide. Did she know, too? "Nothing that concerns you," he said.

"I only want to help. Matra is old. She will not be with us long. Then when she is gone we will have a glorious new rule under Anetel. There are many things you must learn," she added meaningly. "I only want to help."

Her gaze lingered upon him. She turned abruptly and was gone.

Ketan was left with an undefined sense of conflicting forces within the Temple itself as he gazed at the closed door. The guide, Nelan, had exhibited an unmistakable antagonism towards Matra.

He shrugged it off. There were other problems, too important for him to concern himself with petty schisms in the Temple organization. He sank deeply in a soft chair and uncoiled the tenseness that pervaded every muscle of his body. The lack of sleep and the bewildering forces he had perceived swirling in intangible patterns about him and about all mankind during the past three days had drained his energies.

The chair was equipped with both entertainment and refreshment panels. He selected light food and drink which swung out on a shining tray and elevated to the proper level before him. He wondered

what the food was as he tasted it. New and untried foods had long ago ceased to surprise him since the Food Center produced a new creation regularly every tenth of a *tara*. This was exceptionally good, however. If he had been outside the Temple, he would have been moved to recommend that it be rated a permanent item. If it did not obtain enough recommendations, it would be abandoned forever and the Center would go on to new and endless creations.

He inspected the titles of music on the other panel and noted with a start that many of them had been produced in Kronweld only recently. That meant there was regular exchange between the Temple and the city, even as was implied by the visit of Matra to the *Karildex*.

Music began to flow into the room as he made a selection. He settled his body lower in the chair and abandoned his mind to idle scrutiny of the compartment.

It was designed with the ultimate of luxury that the skills of Kronweld were capable of producing. No Seeker on the Council itself, or in the First Group could obtain more of comfort and expensive surroundings than Ketan found himself in possession of.

There were no natural windows, of course, but compact energizers threw a sheet of luminous air against the ceiling and spread a soft, compelling glow over the compartment. Ketan reached out and turned the control switch. The glow slowly shifted from its restful cream to a cool green and through a quiet blue to violent red and crimson shades. He brought it back to light green and lay back in the chair.

How long he slept he didn't know. But when he awoke he was refreshed though stiff in his back and shoulders.

He rose and shifted the lights to bright blue-white glowing. He shrugged out of the induction robes he still wore, with a grotesquely unfeminine motion. Across the room the reflector surface gave him back the image of his woman form.

He grimaced but stepped closer to inspect his job of sculptoring and see if the plastic were holding up. He inspected his face and was thankful that he had submitted early to permanent removal of his facial hair. Without such, his disguise would surely have been hopeless.

Most of the men of Kronweld welcomed the removal, but occasionally some Seeker retained it as a curious mark of distinction—or perversion.

Assured that his sculptoring was still intact, he searched for the spray room and was about to step under the shower of chemical cleanser and invigorator when he looked down as his body and laughed aloud. A lot of invigorating he would get from spraying the layer of plastic. But he stepped in from force of habit and was surprised to find how much actually penetrated the porous material.

He stepped out and dried before the warm flow of air that fanned

over him. He dressed then in the robes the guide had indicated would be proper for the day and sat down at the larger refreshment panel for a full and more diverse meal.

His mind still refused to register any definite familiarity with the surroundings. Yet there began to be insistent tuggings as if from a dream that could not be recalled.

And somehow, these tuggings of mind centered about the ancient, Matra. He knew he had never seen her before in his life—as far as he could remember—except for the night at the *Karildex*. But the image of her face drew him more persistently each moment.

Probably he had seen her before he had emerged into Kronweld. Perhaps some strange bond had been established between them. It seemed fantastic, but so did her conversation of the day before. So did everything that had occurred since he met her that night alone.

Sudden chimings of a hidden bell startled him as he ate. Then a voice spoke from the same unseen source.

"The new section of Ladies will assemble in the corridor at once, prepared for admission to the chamber of birth."

He hurriedly gulped the remainder of his food, adjusted his garb to what he presumed was the proper fit and brushed his hair smooth.

He opened the door and stepped out.

Already, most of the others were at attention before the doors of their compartments. Nelan was waiting for him. She offered a nod of expressionless greeting and remained silent. A column of marching Ladies was advancing down the hall. As they passed, each pair standing by the doors joined them.

Ketan could not quell the pounding within his chest nor the flush that suffused his features. The climax of his *tara* of Seeking and hoping was about to come. He was to learn the truth of the secrets he had sought for so many *tara*—to witness at last the creation of life.

But there was more than excitement. There was dismay and fear mingled in his emotions. Every sign, every indication pointed to something far different from the thing he had imagined the creation of life to be.

He had seen no sign of a single man being present in the Temple—except himself. How, then, did life come into being? Had some incredible means been produced by Seeking to accomplish it by other factors.

The column came abreast of him. He and Nelan joined in. Her eyes searched anxiously for Elta. He had not discovered where her assigned compartment was. Now he saw her a dozen doors ahead of him. She looked slim and deceptively fragile in the robes she now wore. They were more drab than the induction robes, but they seemed to heighten, rather than decrease the loveliness of her.

His hungry eyes tried to attract her glance, but she did not see him as she and her companion went to

the rear of the column.

They wound through labyrinthine halls. Once, he caught the sound of a pain cry far away, and all eyes turned towards it momentarily—and forgot it. But something hard congealed within Ketan.

He remembered the creation of new life by the Bors—

Abruptly, they came to a dead end. They halted while a guide pressed a lock button. Thick, ponderous doors slid aside with reluctant inertia. Ketan puzzled at the massive construction. As he passed through, he saw they were more than half his height in thickness.

With fearful expectancy the new Ladies gazed into the chamber revealed before them.

Dull green glow illumined the utter barrenness of the place. There was only dead, stifling silence.

The chamber was shaped like a quarter of a sphere in miniature of the Temple itself. Ketan sensed that they were at the very core of the building.

But there was nothing within the chamber. No—his eyes adjusted to the dim glow and he saw two figures silent and statuesque seated before a niche in the flat wall.

The niche was a shallow, semicircular opening no higher than a man. Dark shadows lay in its depths. The two immobile girls did not turn nor glance about. Their staring gaze remained firmly fixed upon the niche.

There was one other figure within the room. It stood motionless and alone in the exact center, watching the group. It was Matra. Her eyes seemed to glow out from the depths of her shrunken face with more brightness than the dull illumination of the chamber.

With a jerky motion of her arm she thrust a finger out straight and pointed to a low marble bench at the back, curved wall of the room, facing the waiters who sat before the niche.

They filed slowly to their place, hardly breathing to break the stillness. They sat down and there was —nothing.

Ketan's mind spun upon its own axis in turmoil, but it could get no grip on any factor of the surroundings. He did not know what he had expected to see. Vague visions of a superb and glistening Seeker's laboratory greater than his own hidden workshop had been in the back of his mind. But this—this barren chamber. What could it have to do with the creation of life?

There was nothing but silence, a queer suspension of life within that chamber, as if the whole energies of life had paused to gather their forces for some colossal demonstration.

Ketan felt it. He knew the others sensed it too, a tangible, physical demonstration. But what it was, he could not guess.

He was almost in the center of the arc of the bench. He could peer into the depths of the niche, but there was nothing to see.

There was nothing—only waiting.

The girls shifted uneasily as their muscles began to cramp and ache

from the rigidity of their posture on the uncomfortable stone bench. But the two watchers before the niche had never moved since the group entered, though they sat on tiny stone pillars, backless and formless.

There was a low chuckling that filled the room like an eerie far away screeching. They looked about. Matra was trembling with her own bitter humor.

"You'll learn patience, my Ladies. There will be days when you will sit alone with endless wonder and pray to the God that he will send new life, that Kronweld has not yet come to its end. But that end will come—unless you find a way to prevent it. Half the halls and chambers of this Temple are barren and unused. They have not been opened for more *tara* than half the Ladies of the Temple can remember. Learn patience, my Ladies.

"Perhaps it will be one of you who waits at the last in this chamber before the dust grows thick and the doors are sealed forever because the God withholds life!"

A chill trembled in the air and settled upon them. The scent of death was an astringent upon their souls.

They sat in wonder and dismay, hopeful at first for some strange miracle to take place before their eyes, watching the mysterious niche with straining gaze.

Then, at last, aching and weary, they began to pray that the useless vigil might end and they be allowed to go back to their compartments.

Ketan, perhaps, was the first to see it.

He stared with hypnotic attention into the black depths of the niche. But those depths were no longer black. With a pulsing like that of the night sky there was a sudden flame of color. Violent, tearing, purple light that flashed over the walls of the chamber in hideous garishness.

It died slowly, and when it was gone they could not see. Then it rose again, swimming up from the depths of the spectrum below the infrared, bursting through a crescendo of light to blind them with radiation beyond the violet.

The two watchers had leaped to their feet, shielding their eyes, and stood tensely before the chaotic display. Ketan stole a half blinded glance at Matra. Even she was trembling visibly at the phenomenon. He wondered what cataclysm was upon them.

One of the new girls screamed.

And suddenly the flame split. In its center was blackness. The blackness spread, and they felt as if unseen hands had grasped the entire chamber twisting and turning it—

The end came suddenly. The flame exploded into blackness and the twisting, tearing hands restored the chamber to a dully lit room full of terrified and crying Ladies.

But the two watchers and Matra were huddled about the little platform before the niche. A new sound rose, a tiny crying sound that echoed the fear and terror that filled the chamber of birth.

One of the watchers turned. In her arms was a tiny, squirming animal form. Slowly, like a dream of vast terror, realization broke upon their minds. That form was a diminutive human being.. They had witnessed the creation of life.

XII.

"Human life is helpless at its creation," the lecturer said. "It cannot feed or walk or make any but involuntary movements. It has no intelligent means of communication."

The group sat in a lecture hall following the experiences in the chamber of birth. The faces of the girls about him showed Ketan the effect of the shock they had received. Three of them had fainted at the horrible ugliness of the tiny animal on finally realizing that it was a human being. The rest had turned pale and sick with uncomprehension. He doubted that many of them actually believed that they had once looked like that.

The buxom lecturer held up a plastic model of the infant man. "There is, fortunately, one function of which all are created capable. That is the ability to take food when properly presented. For this we use a special device. It is a bottle filled with liquid food and fitted with a flexible tip in which is a small hole. An automatic motion of the infant's lips can draw the liquid through the hole. In this manner life is preserved until more efficient intake can be accomplished. Is there any question?"

There was none. A dull insensibility had settled upon the minds of most members of the group, which would not be dispelled for days.

"That is all for today, then," said the lecturer. "You will proceed to the next compartment where the successive stage of development will be demonstrated."

From a wide doorway they were shown the room in which *tara* old beings were learning to walk. The Ladies could not refrain from breaking out in unrestrained laughter at the grotesque actions of the little men and women.

But after a moment's laughter, something halted them. They looked down upon the helpless creatures and a sense of compassion filled them. Even Ketan felt it extending from him towards the tiny, misshapen beings who would some day grow into perfection.

The instructor nodded with approval and smiled as the girls advanced hesitantly towards the babies and gave them a hand.

From there they passed on to other compartments where larger children were engaged in learning to use their arms and legs and develop skills. In others, they were learning language and the fundamentals of Seeking. On the top level of the Temple were those who were prepared to leave and emerge into Kronweld the next *tara*.

There, it was explained to them how a means of influencing the memories of those who emerged was accomplished through memory domination. This was done to preserve the secrets of the Temple and its sanctity among the inhabitants of Kronweld.

Surging, whipping tentacles of memory tried to find a grip amid these scenes, but all memory of having passed through these stages of existence were only wistful shadows in Ketan's mind.

Alone, in his compartment at the end of the day's tour through the Temple, Ketan knew he was no nearer the solution of the Mystery of the Temple than when he had first emerged from it himself.

For a time the strange baffling forces he had witnessed in the chamber of birth had confused him. Now he saw clearly that they were only the mask to a still deeper mystery. Life was not created by those flaming fires. Such a thing was a grotesque farce.

Where, then, did the creation of life take place? How could life even be present in the midst of those flaming lights? Was all he had seen merely a half-knowledge which was reserved for the newest Ladies while the older ones were partakers of greater Mysteries?

He determined that there was one way only of finding out. That was from Matra. He felt confident that she would ask him to come to her again. And when she did he would find the answer to these questions if he had to choke it out of her skinny throat with his own hands.

He wished he could see Elta and talk with her. He was more than ever puzzled by her deliberate com-

ing here. He could see no purpose in it, especially when she knew of Matra's enmity towards her. It was conceivable that she had come to attempt an understanding with Matra, but again Ketan was baffled by a stone wall of ignorance. What understanding was necessary between them?

Who were the Statists?

Ketan's guide, Nelan, was more a guardian than a guide, it seemed to Ketan. She attached herself to him as soon as he left his compartment and left him only as he returned to it. He was sure her duties did not call for this close observation. He noticed, however, that many of the others were treating their student Ladies similarly.

She spoke at midday meal several days later. "Are you growing accustomed to your life with us?" Her attempt at a friendly smile was grotesque.

"I like it," Ketan lied. "It's the most sacred life a woman could live."

"You are right." Nelan nodded. And Ketan noticed now that there were a half dozen others crowded around as if assenting.

"But that proves one thing," Nelan went on. "Our position should entitle us to the best of the possible compensations in life. We deserve many of the comforts and liberties of life that we could enjoy here but don't have. It should be our right to possess them."

"That's right," another, older woman nodded. "Matra has never cared much about us having conveniences and comforts in our lives. She always insisted so much on devotion to duty that we had scarcely time to live."

"Devotion to duty is our primary objective in life," Nelan pointed out solemnly. "But we have a right to ask for those things that we deserve. There is a sure way to get them."

Ketan wondered what more they could want. There was more luxury of living in the Temple than he had ever dreamed of in his own social statis in Kronweld. He wondered where all this was leading to.

"We need your help, the help of all you younger Ladies," someone else spoke directly to Ketan. "Anetel will get them for us if we support her."

"What are you talking about?" Ketan demanded.

"Matra is old," Nelan said. "She will soon die. One of us will have to be prepared to take her place. Her successor will be chosen by common consent. Most of us have decided in favor of Anetel. She is the natural one for the place. She will build a new era of progress for the Temple of Birth. The new born will emerge into Kronweld far more capable of taking their proper places there.

"And Anetel will see that conditions within the Temple—among the ranks of the Ladies—will be greatly improved. We will have better living quarters, more freedom to enjoy our existence and compensate for the things we have given up. Doesn't that sound desirable?"

Ketan nodded. "Very desirable."

They smiled upon him. "Then you will assist us in supporting Anetel?"

"Yes."

They smiled more and remained with him throughout the meal.

Idealism.

The word churned bitterly in Ketan's mind. So this was the holy, sacred Temple of Birth—and these were the unselfish, sacrificing, sacrosanct Ladies who devoted their lives to the high things of existence. These petty, mean-minded old women who harped about in cliques groveling for the minor advantages of prestige and rights within the Temple.

Ketan wondered what the starry-eyed girls thought now—those who had listened so raptly in Preparation Center. They probably grew hardened as the *tara* passed.

But gone was any sympathy he had momentarily possessed or any doubts he had held about desecrating the place.

Ketan had never spoken to Anetel directly. He had seen her only as he passed in the halls and corridors.

She was tall and blonde and stately, with finespun golden hair. Her skill with the new born was unmatched. Her apparent coldness at a distance was deceptive. In direct speech—which was as frequent as necessary, and no more—her personality was like liquid warmth flowing over her listener. She put at ease the most timid of the Ladies when she chose to speak to them. Those repelled by the lined and shrunken features of Matra were easily nurtured by Anetel's presence.

She was not small and insinuating, nor was she powerful and brusque. She did not gather with any of the small groups that collected about the halls and rooms when the duties of the day were over. She did not fawn over the new arrivals.

She defied Ketan's analysis.

He hated her on sight.

He knew the words spoken by the campaigning lieutenants in the hall were words they had first heard spoken in private by Anetel. He knew she was acutely aware of every Lady in the Temple and studiously distributed her agents where their propaganda would do the most good.

More than often, he wondered why Matra failed to do something about it. The Temple personnel was a shambles. Matra could not help knowing it.

Perhaps she had simply reached the end of her power.

But when he thought of those deep, hypnotic eyes and remembered her before the keyboards of the *Karildex* he did not believe that.

For seemingly endless days, though actually they were not many, Ketan and Elta and the rest of the new Ladies learned their routine duties of caring for the developing human beings.

Ketan found it strangely amusing to care for the newest ones, assisting them in their feeding and

their more repulsive personal needs. He thought of Teacher Daran and the others he had known at the House of Wisdom walking in and recognizing him at these duties.

Then he remembered that Teacher Daran had been killed—killed by the forces that ruled this Temple in the hands of Matra—

He knew he had but little longer to stay. He had to reach a decision and act soon, for his disguise was wearing. The plastic was not substantial before the daily twisting and friction to which his body subjected it. Each night he had to soften it a bit with hot water and remold it. He wondered curiously if some of the Ladies didn't notice a strange day-to-day metamorphosis in him.

He had long ago made his final decision with regard to the Temple. It awaited only his assignment to a watcher's post in the chamber of birth.

In that chamber lay the solution to the whole Mystery of the Temple.

He thought himself calm, but the day his assignment came his breath quickened and his pulses leaped. He felt that at last he stood on the threshold of a solution.

He wondered who his companion on the watch would be. It was too much to hope that it would be Elta. He hoped for someone who'd not interfere with his investigations. But he'd find out what he'd come for if he had to kill the other watcher to keep her quiet.

It was Elta.

She stood at the entrance to the chamber and looked unbelievingly at him. She half turned as if to escape.

"Elta—" he whispered, "this is more than I could have hoped for."

Her form seemed to sag wearily. "Why did it have to be you?"

"Elta! Aren't you glad that we can be alone together for a time?"

"No—listen to me, Ketan." Her voice was anguished now. "I came here to do a certain thing. Will you trust—this time?

"Perhaps I can do all that you want done—the destruction of the Temple. But you must leave me alone here. Go out of the chamber. Go back to your room. You can get there without being seen. When I have finished, I will come back to you. We can fight our way out for I have discovered where many Dark Land Weapons are hidden. Will you do this for me?"

"No."

"Ketan—"

"No, Elta. I'll not leave you to go ahead with whatever mad plan you have. Why you ever came here, I cannot guess—but I have my own purposes and they are more important than anything you may have planned."

"I have spoken with Matra. She approved—"

Ketan stared at her. What could he believe? Matra had passed lethal judgment on Elta's life. How could she approve any plan of Elta's which might involve destruction of the Temple? What was Elta trying to do?

"I can't believe that," he said. "I don't think destruction of the Tem-

ple is possible without first learning the secrets of this chamber. How is life created within those fires that flame up in the niche? What is their secret? I intend to find out."

"Those are the forbidden things of Kronweld," Elta murmured. "No man is meant to know them. No one within the Temple knows them. Do not tamper with forces beyond man's understanding."

"You don't believe that any more than I do. Why have you become so cautious? It was not that way when you first worked within the ranks of the Unregistereds, helping me to organize them."

"Perhaps I have come to realize there are forces beyond man's strength to combat. Forces not worth combating because they mean only battering heads against stone walls and slowly washing away life's energies and chances for happiness. Leave me now, Ketan. I will come back to you quickly."

"No."

Never, in all their association, had he felt so far distant from her as he did now in the small, unholy chamber in the depths of the Temple.

Why did she want him to leave her alone in this place?

It frightened him. He had a sudden glimpse of what life would be without her. It was like looking over the edge of a deep black chasm. It left him panicky and he drew back from the thought.

She was standing in front of the niche, staring into its depths. He had an impulse to grasp her in his arms and attempt to crush out the bleak mysteries that thrust between them like ice curtains.

It was in vain. These things could not be swept aside by a single embrace. They were only branches of the deep-rooted faults buried deep in the society of Kronweld.

He strode about the dull, bare chamber and examined it minutely. There was nothing but blank walls of formed stone.

The niche itself was just as barren.

He crawled into it.

Elta screamed a terrified cry. "Ketan—!"

The shimmering violet glow was rising in the depths of the niche. For an instant it seemed to engulf Ketan, and his body took on a terrible transparency.

He leaped from the platform back into the chamber. His face was white and he was shaking uncontrollably. "Elta, I—"

"Look. Here it comes."

The white fire was leaping at them, splitting into utter darkness. Before his eyes he thrust up a veil of the robe he wore and stared into the incandescence.

Then it was over, and on the platform a squealing infant human lay.

Elta lifted it in her arms. "Ring the alarm," she said dully.

"Wait . . . there is something—"

A strange white strip was wrapped about the infant's leg. Ketan unwound it and exposed a deep-cut injury. And a loose crumpled sheet fluttered to the

floor. He picked it up.

"It looks like a message—" He laughed a little shakily at the incredibility of the idea.

Elta glanced hastily at it. "Destroy it. Quickly, Ketan. Someone might come in and see us with it. I'm afraid—"

He looked up from the sheet of paper into her eyes. "Did you look deep into the light when it came at the time of birth. Did you see a kind of vision in it?"

"No, we were warned—"

"We were warned not to see what they don't want us to see. When that first wave of light engulfed me it seemed as if this chamber vanished and I was flung for a moment into another far away world. There was a great assembly of people in a hall greater than this whole Temple. I stood before them at the base of a great machine and they looked up at me with fear and pleading in their eyes. They were crying out to me to come to them—to save them."

Elta turned away and would not meet his gaze. "It must have been an illusion."

"No, I saw it—and I shall see it again. Next time I shall walk towards it. I shall go through it. I shall find that great hall and the crying, pleading people—"

XIII.

He did not sleep that night. As soon as he was free to go to his compartment, he locked himself in and took out the sheet that he had found on the baby in the chamber.

It was too fantastic to believe that this was an actual message.

Yet, why not?

The inescapable logic of his Seeking told him that the infants that were created amid the flames in the chamber must have had natural parentage somewhere, sometime.

Was it the great hall filled with people who had looked to him for salvation? Their eyes stared at him millionfold when he tried to close his own eyes and not think of them.

It did not take him long to decipher the characters with doubtful meaning. If it were correct, it was a terrible meaning. Not the words themselves, but it became the voice and the cry of that visioned concourse of people.

It said: "If any of you live, come through to us. Save us. Bring weapons."

That puzzled him most—the words he had translated as "weapon." Weapon was a guard. It had only two meanings, either referring to a Serviceman or to a protective ring such as surrounding the Temple of Birth, preventing trespassing from Kronweld.

Explorers in the Dark Land had devised an adaption of the principle of the protective ring which would kill Bors and other animals at a considerable distance. It was such a weapon to which Elta had referred earlier.

If he had translated correctly, the message asked for such a weapon.

The translation, such as it was, had not been hard because the char-

acters appeared to be no more than twisted distortions of Kronweld characters, and a few unknown additions. It was a strange language.

While he stared in contemplation at it, a thin needle of sound leaped into being in the depths of the night.

It sped in echoing resounding through the great halls and long corridors and pierced every sleeping ear. It became a scream of death and terror that cried through the Temple and woke every being.

Ketan ran into the hall to find it lined with terrified Ladies, scanty and sheer in night apparel.

Before he could even press through the hall and find the origin of the cry, they were being herded back by the forceful minions of the Temple. Adherents of Anetel—Ketan recognized them.

"What happened?" He added his voice to the babble, and it was lost. No one knew where the scream had come from.

The Ladies pressed forward, taxing the staff that tried to herd them back. Then for a moment the pressing surge relaxed while eyes stared expectantly down the corridor. More of Anetel's guards came from the other end and the press in the hall began to move slowly back.

Then slowly, down the line, so spontaneous that no one knew who brought the information, passed the deadly rumor: "Someone tried to kill Anetel . . . stabbed with a knife . . . ran through the hall with it sticking in her back . . . one of the new girls did it . . . no one knows her name—

"It was Elta, her name was—"

Ketan's mind groaned under the weight of that statement and refused to accept it. It came down the line again—and again—Elta tried to kill Anetel. They were all whispering it—a crazy new girl—got in a fight with Anetel—tried to kill her—was she dead yet? Elta was her name.

Ketan went back into his room and closed the door. What could have happened, he asked himself over and over again. He threw himself in a chair and held himself perfectly still for the space of a hundred heartbeats.

There was nothing he could do to assist Elta yet, if it were true that she had tried to kill Anetel.

But why should she do such an insane thing? *That* could not be the purpose for which she had come to the Temple.

He must not reveal himself sooner than necessary. He forced himself into semicalmness until the furor in the hall died down. He must wait until morning to obtain the available information. There would be time enough to act then. There must be— He must hold himself in abeyance until then.

He did not know whether or not he finally slept, or how long he sat there. He was only aware next of a voice within the room calling out — It whispered suddenly and low and unintelligibly. He twisted his head. There it was again. He spotted the source—an apparently blank space on the wall. He lis-

tened, holding his breath.

It came again, as if in an agony of death. It was the voice of Matra.

"Ketan . . . Ketan . . . answer if you hear me. Ketan—"

"I hear. Where are you?" he whispered hoarsely.

"My room. Come to me at once. Watch. See that you are not discovered. Come—" The voice trailed to inaudibility.

Swiftly, fully awake now, Ketan crept to the door, opened it a crack. The hall had long been cleared, and the Ladies of the Temple restored to troubled, fretful sleep.

But one of them—undoubtedly a cohort of Anetel—was patroling the far end of the corridor. He saw her disappearing back as she turned a corner.

He raced out and down the hall on tiptoe. He kept his head turned, almost running backwards to keep an eye on the far end. He saw the foot of the slow moving guard appear beyond the corner again and flattened himself in a shallow doorway. It was far from deep enough to hide him.

He flattened the side of his face against the door and watched the guard with one eye. His breath sucked in sharply as she started down the hall towards him.

He thought in that instant of Matra. Why had the old woman called him at this time? Could it be that she was dying?

The thought set his pulses pounding. He had to hear the rest of her story before—

The guard had stopped now and was peering down the hall. He drew himself inward and literally willed himself flatter.

Then slowly she turned, satisfied that all was well. He held his breath as she retreated and finally disappeared out of sight around the corner.

Matra's simple quarters were at the end of the hall, facing the opening into the great main assembly room of the Temple. Ketan leaped from the shallow hiding in the doorway and raced once more along the hall. He hesitated before Matra's door. The hall was clear. He burst in.

For a moment he thought the room was empty, until his eyes became accustomed to the half darkness. Then a small, almost inaudible voice spoke his name. It came from a deep bed in the far corner of the room.

Matra was there. Only her face appeared and her hands clutching the edge of the coverlets. They looked like fallen leaves.

"I'm glad you came . . . in time —" she uttered with an extreme exertion. "I am dying, and there are things I must tell you."

"Is there anything I can get?" Ketan asked softly. "Anything to ease your going?"

"To make it quicker? That is what you mean, isn't it? You mean to be kind," she said queerly. "But no, I must talk as long as there is life left in me.

"First, I must tell you of Elta. I was wrong about her. She came to me today, and I was wrong. Be good to her, Ketan. She loves you.

I talked long with her. I showed her what the Statists have done to Kronweld and to Earth . . . you do not know that name, do you? She believed me and she will help you."

A contortion of pain gripped the withered countenance and twisted it almost beyond recognition. Ketan sat hopelessly while the spasm passed.

"The poison—works swiftly," Matra groaned.

"Poison!"

Matra nodded. "Anetel did it. I should have known. But it does not matter. You shall carry on. I must hurry . . . the end is near. I want you to take this ring—"

She slipped a ring from her hand and passed it over. Ketan took it wonderingly. It barely fitted his little finger.

"Keep that. It will protect you from the evil that Anetel plans for you. Yes . . . she knows you. You have been known from the first moment you entered the Preparation Center. It is not that easy to gain access to the Temple of Birth," she smiled grimly. "We both knew you and each of us thought to use you for our own purposes. In that, I have won.

"I fear my time is short." Another grimace of pain crossed the weathered face. "Elta knows what to do. She will tell you the rest. I wanted you to know that she is innocent of any harm."

"But why did she try to kill Anetel?"

"She . . . did . . . that?" The crone tried to rise in bed and sank back with a groan. "Oh, the fool . . . the little fool . . . the wonderful little fool—"

"Why?"

"She thought to help. But it will be of no avail. We have the situation under control— But you say she *tried?*"

"I am not certain of anything—only what is rumored in the Temple. Anetel's minions are keeping the corridors cleared."

"Yes . . . she has had her own organization among us for a long time. I have watched her build it up. But it does not matter. I have my own, too, and we have prevented her from sending any important information out of here."

Quick pain now embraced the husk of Matra, pain that would not leave. It twisted her face and clouded her eyes until she shut them and wide pools of liquid formed in their corners, pools that widened and at last burst and flooded down the canyons of her face like overflowing reservoirs.

"This is it," she gurgled through the pain. "There was so much more I had to tell you. But Elta . . . she knows all of it. See that she has her ring . . . it may be necessary for her, too. Do not lose them, either of you. Now . . . God bless you!"

Her body twitched, her throat noised horribly—and she lay still.

For a long time Ketan knelt beside the body, uncomprehending, unable to move a muscle. He stared down in utter bewilderment and wonder. And a terrible sense of alien forces and powers over

him came with the realization that it was not the God referred to by Nabah and his followers to whom Matra had called out for blessings upon him.

He gazed down upon the tired little body. What burdens it had carried during the infinite *tara* it had existed! Now, already, disintegration had set in. Probably no man would ever know what those burdens were.

He rose abruptly, conscious once more of his own position and the peril of Elta. He looked at the curious ring that Matra had given him. It was only a shining golden band. And Elta had one like it. How could powers of salvation exist in the tiny, impotent looking thing?

The hall was still deserted as he stepped back into it. Not even the guard was in sight. He returned quickly to his own room without incident and sat down in the deep chair.

The death of Matra had shaken him. There was nothing so repellent as witnessing death. In Kronweld, those who escorted incurables to the Place of Dying were themselves pariahs, and only the lowest of the declassed could be forced into the job. Death was abhorrent.

Yet, he recalled, there had been a curious peacefulness and serenity about Matra. She was not afraid. She appeared to almost welcome death. She regretted only that the terrible wrestling forces about her had not reached satisfactory equilibrium. Ketan felt an irrational obligation to the dead woman, an obligation to carry on her work even as she had implied—whatever her work was.

But the thought of Elta tormented him. Why had she tried to kill Anetel? The petty internal affairs of the Temple did not concern her. It was the entire structure that had to be destroyed.

He strove in vain to conceive a logical plan of reaching Elta.

They came in upon him while he sat there.

XIV.

Anetel was foremost. Three of her followers were behind her.

Ketan leaped up. Anetel's eyes flashed insolence at him. A satirical smile played about her lips. One arm was suspended in a sling and thickly bandaged. Someone *had* stabbed her—

"You might as well remove that piece of plastic from your nose. It's about to fall off."

"I've grown rather accustomed to it."

"As you will. What a fool you must have been to think you could come in here without detection—and deceive Anetel. I have every record that Matra made of your attack upon the girl at the Preparation Center. Your words with Matra. Your amusing sculptoring each morning. And your desecration in the chamber of birth.

"I want that message! Give it to me."

She held out her hand imperiously.

Katen leaped backwards to the

original and his translation which lay on the table behind him. He flung them into the open waste disposal chute in the wall.

"That is just as well," said Anetel. "I just didn't want it lying around where curious Ladies might wonder about it. We have to remove Ladies who succeed in translating them."

"There have been others?"

"Many of them. That's why you were warned not to examine the babies, but bring them quickly to the reception chamber. But in any case it would have been necessary to sentence you."

He gazed straight into her arrogant face. "And what does that mean?"

"I'm surprised," she mocked. "You were such a great Seeker in Kronweld. You would tear down and destroy this false Temple and replace it with truth. Have you never heard the truth of the Temple and the great door in the Edge?"

Ketan looked puzzled. Anetel laughed. Then amazement flooded over him. That blackness in the niche!

What a fool he had been not to realize it before. That was the Edge itself.

"I recall from your history," said Anetel, "that in your youth you proposed that Seekers find a way to pass through or over the Edge and discover what was on the other side. Well, you shall find out!"

"What do you mean?"

"Hundreds of *tara* in the past, there was a great battle in Kronweld. There were thousands of ignorant primitives who opposed the Seekers. They said that Seeking was against the will of the God and they slew hundreds of our noblest Seekers. But in the end they were defeated and a great Seeker whose very name is now forgotten discovered how to build a gate in the Edge which would open upon a bleak and terrible prison world on the other side. A world that would make Fire Land and Dark Land look as if they were gardens of paradise. He built this gate and the defeated ignorants were imprisoned in this land. It is an eternal land. One in which none ever die and they are there to this day."

A sudden, haunting vision grew up before Ketan's eyes—a mighty assemblage of pleading faces. His own face betrayed his emotion.

"Ah—you have seen them, then," Anetel laughed. "And by your face I see that you pity them. Pity yourself, poor Seeker, for you shall join them and your face shall be one of those to stare and haunt the curious Ladies who shall try to penetrate the secret of life in the future—until they also shall join you."

"You can't believe me so stupid as to believe a fantastic lie as that. Why should nothing be known in Kronweld of this? And where does new life come from? Your tale hardly explains that."

"That—? That was another triumph of the same Seeker who opened the Edge. If it is any consolation, you may know that you were right in your theories of the

creation of life. We come into being in the same horrible manner as the Bors whose association you found so desirable. But the people of Kronweld have been spared this horror. It is the creation of the imprisoned ones who are drawn through the Edge to replenish Kronweld. They are the animals which breed us. The infants alone can come through. The others can go only from here to there."

Ketan stood aghast. As abhorrent as her story was, it would explain everything if it were true. Everything about the Temple was fantastic, unreal, yet each incredible revelation seemed to bring him nearer the truth.

"You will be sentenced today," Anetel said. She turned to leave.

Ketan leaped swiftly after her. Instinctively, she whirled aside and her one free hand snapped out from beneath her robe.

"I think you know what this is," she said.

Ketan glanced at the object in her hand. It was a Dark Land weapon—capable of reducing him to a breath of ash in an instant.

Then as Anetel caught sight of him standing immobile there the flash of the golden ring on his finger struck her eye.

It seemed to sober her.

"So Matra thought to outwit me even as she died," Anetel murmured. "Give me that ring."

Her eyes were hard gems of utter coldness beyond human comprehension. Ketan handed the ring over instantly.

He knew it was either that or let her flame him.

"Good," she said, pocketing the ring with a quick motion. "Now, Elta undoubtedly has one, too. I must get hers."

They sealed the door when they left. Ketan stared dumbly at it. Idly, he glanced down at the barren finger. There was no escape now. But he had at last found the secret of the Temple. He would be sent to the exile beyond the Edge.

A fantastic exultation swept through him. What did his own life matter if he proved his Seeking?

And somehow, somewhen—if he still lived—he would find a way back. Elta was his only worry. What would become of her?

At that moment a voice spoke within the room. "Ketan . . . Ketan! Can you hear me? Speak if you hear me."

"Elta! Where are you?"

"I escaped from my confinement and found the communication center of the Temple. I'm speaking to you by it. I can hear anything that is spoken in your room. Listen to me, Ketan. I know what they plan to do to you. I have stolen one of the Dark Land weapons and I can get another. I have a disguise and will hide in the chamber of birth. I'll be one of the watchers there. I will hide one of the weapons just inside the niche. Let them lead you up to it and then take the weapon and we'll fight our way out."

"No, Elta! That is impossible—we'd have to slay everyone in the

Temple. And then where would we go? All Kronweld would be waiting for us outside, for I know there is communication with the outside."

"We must! There is no time to lose."

"Put the weapon in the niche as you planned. When I go through, follow me."

"No—!"

"That's what you came for, isn't it?"

"Yes . . . yes, but—"

"We'll find the way back. You know what is on the other side, but I don't, and it will be the realization of dreams for me. And I will prove to you that whatever it is you are afraid of is no cause for fear. Now, do as I say, Elta."

"All right. I'm a fool, but it's only because I love you. Have your weapon ready to use the instant the flames begin. You must kill quickly when you get through."

The chamber of birth was tomblike as sentence was passed upon Ketan. He stood silent and waiting before the ebon sheet of the exposed Edge.

Behind him, white-robed Ladies of the Temple stood like attendant ghosts.

He did not give a betraying glance at the watchers post where Elta sat. He wondered how she had succeeded in escaping. Her presence gave him a sense of satisfaction and comfort for he knew that no dangers they could be going into could match the danger to Elta here in the Temple.

Behind him he now observed two burly Ladies with long padded poles. These were for use in case he became reluctant to walk into the flames. And still farther back was Anetel with her waiting Dark Land weapon in case the two assistants failed.

Ketan was still clad in his plastic disguise and Anetel had ironically ordered him to clothe in the induction robes with which he had entered the Temple. "A new induction awaits you," she had said.

Now they waited. He hoped it would not be long. But he well knew that it might be days even, before another infant appeared amid the flaming opening of the gateway.

It was coming!

The flickering purple shadows crossed the ebony sheet in the depths of the niche. A low cry came from the assembled Ladies. Ketan glanced towards the spot where Elta's promised weapon was to be.

There was nothing there.

He stared in dismay.

The purple was becoming red. A wave of deep, blasting heat swept momentarily over him. Then it was gone. The light rose through the spectrum and flamed white and became edged with blue.

He hesitated and turned. There was a vicious jab in the small of his back that cramped him with pain. It drove him forward into the blue-white flames.

His backward glance took in the watchers post. Neither of them was Elta.

He did not have time to comprehend the catastrophe of this. The poles jabbed the small of his back in sickening pain. Then he was running down a long corridor of twisting, writhing flames that flung his body about and tore at him with tangible fingers of fire.

They stared up at him as if time had stopped for them eons ago. There was fear and terror frozen into their gaping faces—thousands of them. Wave on wave—wave on wave—they surged and cried out to him.

And they shrank back from him as if from a lightning blast. He was glowing, burning—every fiber of him—with an incandescent blaze that would have seared blind any normal eyes.

But he was not normal. He was a god in an inferno of light, a great bubble of it that swept him on and on through the reaches of space and eternity, beyond realms where Kronweld was only a half remembered dream that had never existed in reality—into a land where mutely pleading faces looked up at him and cried out for salvation. Wave on wave—wave on wave—

The light in and about him faded and died. The vast concourse of humanity vanished.

He was alone, utterly alone in all the universe. There was not another creature in existence. Dreamless and at peace he floated in the vast void that stretched between creations his mind could not grasp.

He began to laugh. This was a stupid, an impossible existence. He, therefore, had ceased to exist. But he had had existence a moment before— The moment before—he couldn't remember it. There was no moment before. He was in eternity and there is no before eternity.

His laughter shook the light spangled vault that encompassed him. It undulated the space in which he floated and he began to rise and fall—rise and fall—in increasing waves that swelled to prodigious amplitude. Waves that flung him from one end of the universe to the other and returned him, smashing and shattering great incomprehensible suns and destroying worlds in vast sweeps.

And then he burst the expanding wave and plummeted through other times and other universes, borne on the mad explosion of a creation.

His vision congealed. His feet were pumping slowly up and down, slogging through deep, wind-blown sand. From horizon to horizon there was only sand, white-hot sand that reflected the light of a single globe in searing radiance.

In the midst of the desert there rose a great towering pinnacle of rock. A shaft of salvation. He must get to that rock. His life depended on it. The life of Kronweld—he paused a moment and struggled to recall what the word meant—Kronweld depended on it. He must reach that pinnacle in the blinding sands.

TO BE CONTINUED.

Thought

by FRITZ LEIBER, JR.

***With** his technique, he claimed, he could read any thought a man might have from graphs and charts. And—the claim iself broke him completely!*

Illustrated by Orban

"So, you see, there is no thought I cannot catch."

Harborford's chin jutted arrogantly as he said it. He looked rather like a Napoleon of the mental realms, with gray thought-tracings instead of maps scattered across the desk in front of him and showing ghostlike and gigantic in the sunlit projection space behind. Yet mingled with the arrogance was a sincerity that made it difficult to take—or at least to show—offense.

Blacklaw was up against this difficulty.

"That's a large statement," he remarked. "I should think there would always be some cases—"

"No!" Harborford's stumpy hand thumped the pile of tracings, then seized one and pointed at an oddly humped trace which stood out plainly from the shadowy pattern. "See, even when you were thinking that I could not catch your thought, I caught that thought!"

Blacklaw grinned woefully. "I'll admit you plucked out some of my hiddenmost secrets," he said. "An amazing performance, considering the brief time you had for orientation. Still, I have the feeling that you'd eventually run up against certain insurmountable difficulties. It's an elusive point I'm trying to make. I don't know quite how to express it, because—"

"Because it's a false point," Harborford interrupted conclusively. "If I had you back in the projectorium, that would become obvious at once. You could see the inconsistency indications, the breakage lines signifying illogic, for yourself. No, I'm afraid humanity must face the fact that, given time and the proper facilities for research, there is not one of its thoughts which I cannot ferret out." He sat down.

Blacklaw followed his example. He felt a twinge of regret which did not show in his lean, mobile face. It was beginning to look as if he would have to use Harborford's dogmatic challenge for the theme of his article, even though the resultant product would resemble primitive twentieth-century journalism. He had rather hoped to do something quieter for the *Newsbeam*.

He brushed aside these considerations. "Let me see if I have the general outlines straight. Don't want to pull any boners, though of course I'll send you a transcript for corrections before we beam it." Harborford nodded gravely. "Well, as I understand it, thought involves changes of electrical potential throughout the brain. These changes interfere with the uniform sub-photonic beam passing through the subject's brain and are eventually projected as a pattern of grays."

"Making use of the technique of beam-amplification which has revolutionized astronomy," Harborford reminded him.

"Yes. Well, then doesn't a lot depend on the angle from which you take the projection? Wouldn't an arbitrary change in the angle at which the beam passes through the subject's brain make the resultant tracing almost unrecognizable?"

"Only in the case of two-dimensional tracings. Kesserik, would you—" Harborford motioned to the dark, wiry man at the far end of the room. He manipulated some controls. It became black. In the empty space beyond Harborford's desk, a mistiness became apparent, took on thickness, manifested itself as a dome-shaped dancing of lights and shadows.

Harborford stood up. To Blacklaw he was a stubby, square shouldered silhouette, from which came a didactic voice.

"There are, you see, not one, but a series of beams. Each focuses one potential plane in the brain, and one only. These planes are

projected as a packet, building up a three-dimensional picture. Very much as, in primitive television, a two-dimensional picture was built from single points of light."

He walked back from Blacklaw until he was in the shadowy dome. Then he turned around. A constantly altering flicker illumined his chinny face.

"I am now standing in such a three-dimensional picture. Dark light, timed to explode into visibility at an exact distance from the projector, does away with the need for a series of screens. The picture is not directly projected, of course, from a human brain present with us now, but from one of the multilevel films made in the projectorium. It comes, however, to the same thing." He spread his arms wide. "I am standing, as it were, in the midst of a thinking human brain. Each flicker is a nerve discharge, or a thought-pattern, or a conscious thought. And I can interpret every one of them. Nothing is hidden—not the faintest twinge of feeling or the subtlest hint of an idea."

His voice was triumphant and raw with emotion, as if all this were very important to him in an intensely personal way. Blacklaw wondered why. As before, he was both impressed and repelled. Bathed in that swirling flicker, Harborford seemed like some evil gnome that had crept into the human brain to strut and mock. Blacklaw knew this was a foolish feeling, yet it was so.

The flicker dwindled. Sunlight returned. The dark, wiry man, who seemed faintly bored, went back to a desk at the far end of the room.

Harborford said, "So, you see, the three-dimensional picture is basic. Two-dimensionals, however, are convenient for reference and comparison. In them the packet of planes is compressed into one plane, with the resultant blending effect. They are generally taken from a frontal position, to insure uniformity."

Blacklaw frowned. He said, "I think I understand that part of it now. But that only leaves you with a very complex and shadowy pattern of grays. I don't quite see—"

Harborford bridled. "A pattern which we can analyze down to the last detail. We can pick out and follow an individual thought-trace as readily as a trained musician, listening to a symphony, can recognize the note of a single instrument—or its pattern in a sound track."

"I didn't make myself clear. Analysis still only leaves you with a pattern of tracings, meaningless by themselves. It's in the interpretation of the tracings that I'd think there'd be room for error."

"Not at all." Harborford was dogmatic. "While the tracings are being made, the subject is presented with various stimuli — pictures, words, and so forth—and he gives us a verbal account of his thought, which is recorded. Stimuli and account are afterwards correlated with the tracings. In a single instance, error or deception would be

possible. But when the instances are multiplied, when the same ground is covered again and again, any such possibility cancels out. We know the thought back of each individual trace and can identify it whenever it reappears—whether in the median size and dark gray of a sensation, the light gray of a memory, the isolated black pattern of a so-called unconscious thought, or the large and comprehensive pattern of an abstraction or generalization."

He warmed to his subject. "The whole logical process is open to our view, just as if it were diagramed on a blackboard. For example, you have in mind the knowledge of individual houses and also the general idea 'house.' The former would show as a set of similar small traces, the latter as a large trace covering them all and growing from them—a kind of magnified composite photograph. Similarly, we can identify the traces representing the subject's knowledge of a scientific law and the instances of that law. Most important, if one of the instances does not agree with the law and therefore tends to be suppressed, we can spot it at once—the inconsistency indications are very marked. Ultimately, all scientists and thinkers of any consequence will have their thought processes checked at frequent intervals. In this way they will become truly infallible thinking machines. All cloudiness and freakishness will be eliminated from human thought."

Harborford leaned back and smiled at Blacklaw. His voice was easier now and friendly, marked by that sincerity which tempered his arrogance. "Of course, each person requires detailed study. The brain is very plastic with regard to which set of neurons does which job. Fairly similar thought patterns may mean quite different things in two individuals. Although, after spending years in interpreting tracings, one acquires an amazing knack of catching on to the patterns of a new mind. You saw what I was able to do in your case."

Blacklaw rehearsed his woeful grin.

"However," Harborford continued, leaning forward, stubby finger tapping the pile of tracings strewn across his desk, "there is in the long run no substitute for detailed study of a single individual—sessions running over months and years, until you can interpret every twist and turn of his mind. I have literally hundreds of miles of taped files on single cases." His expression grew suddenly angry and bitter. "Unfortunately I have been rather unlucky in my choice of subjects for detailed study. Each one of them found some excuse to break off the sessions, just as I was getting to know their minds completely." His voice became heavily sarcastic. "They professed to be afraid of losing individuality, of becoming mere mental guinea pigs. They developed or claimed to develop, a wholly unreasoning terror—as if I were some primitive medicine-man trying to trap their souls." He laughed harshly. "For-

tunately, I have at least one subject on whom my files are complete—myself. For years now there has not been a single thought-trace taken from my mind that I could not immediately interpret."

For a moment Blacklaw wrestled with the image of Harborford intently studying his thoughts both from inside and out, hour after hour. Then he said, "I believe I can understand the attitude of your subjects. I don't imagine they were insincere. After all, privacy is something that most people prize highly—mental as well as physical. There's something terrible in the thought of not having at least one corner of your mind wholly your own, to which you can retreat."

"Superstition!" Harborford said harshly. "A reversion to primitive attitudes—the secrecy of the hunted or hunting beast! An outcropping of that illogic and lack of realism which has at regular intervals vitiated the progress of human thought—under the guise of mysticism, intuitionalism, inspirationalism, or some other nonsense! Fear of science's light! But I have ended all that."

He threw himself back, breathing heavily. His eyes studied Blacklaw, whose smiling composure remained unbroken. Gradually they changed. The angry glare was replaced by an embarrassed grimace. He leaned forward.

"Pardon me," he said. "But it is a matter on which I feel very deeply. You see, in my childhood I had a very unpleasant experience—"

His voice sank. His hands played aimlessly with the piled tracings, shuffling and reshuffling them. He murmured, "I don't know why I'm telling you this—"

Blacklaw did. It was because people didn't know why they were telling him things that he was the *Newsbeam's* ace interviewer.

"—but if you've read anything about me, you probably know it anyhow. My parents were Irrationalists—you must have heard of that wild cult, though now it's almost died out. I was an only child, educated, if you can call it that, at home. They looked on me only as someone on whom they could try out their theories—a defenseless new convert to their crazy cause. There were other regrettable circumstances. As a result I spent two years in a mental sanitarium."

His hands went on shuffling the tracings. His eyes stared at them blankly.

"Ultimately the results were very fortunate. My parents lost control of me. My recovery left me with an icy enmity to any sort of mental secrecy—any hobgoblinism—and a burning determination to lay bare all the hidden corners of the mind, my own and others', so that the light of science would bathe them and forever prevent any cancerous thought-growths in darkness. That determination has never left me. It was that which led me to the study of psychology and ultimately to these present researches in a field which others pioneered. It is back of everything I have done. It has—"

The sentence was left hanging in the air. Blacklaw was conscious of a peculiar tremor in the last word—something that lingered and somehow gave him a faint shiver. He looked up.

Harborford's hands had stopped playing with the tracings. Gripping one they were frozen. His eyes were fixed on something. Either he or the sunlight had grown a shade pale.

It was very quiet in the big workroom. From the far end came a faint shuffling noise as the dark, wiry man shifted at his work. Again Blacklaw shivered faintly, without knowing why.

"What is it?" he heard himself ask.

Harborford's voice was almost normal—there was only the tiniest suggestion of a choked, muffled quality.

"This trace . . . I don't recognize it . . . I can't interpret it . . . I don't know what it means—"

Swiftly Blacklaw moved behind the desk, peered over Harborford's shoulder. A stubby forefinger, almost steady as a rock, followed a misty, humped shadow all the way across the mazy pattern. "I don't know how I ever came to miss it."

"One of mine, isn't it?" said Blacklaw quickly.

"No." Harborford paused heavily, "one of *mine*."

"But it looks so much like that

trace you pointed out to me a little while ago—"

"No! Any such resemblance is purely superficial! A layman's mistake!" Angry denial, not untinged with panic, tightened Harborford's throat, then subsided as he returned like one hypnotized to the tracing. "But what I don't understand is how, having had such a thought, I don't remember it . . . how I came not to record it."

"But a person has so many thousands of thoughts, so many tens of thousands—" Without having intended to, Blacklaw found himself trying to reassure the other.

"Every one of which tens of thousands I have studied and docketed— No!"

"It might have been unconscious—" Blacklaw felt foolish making these amateurish suggestions, yet he didn't stop.

"Impossible! Then the trace would be black and small. This has the faintness and large size of a generalization. It is a master-thought—something I would never forget. I can readily recognize the lesser thoughts from which it springs and which it sums up. They are, in fact, my own cases—those subjects, including myself, which I studied so exhaustively." He feverishly scrutinized the tracing. "There must be inconsistency indications. There must be!"

Suddenly he looked up at Blacklaw. It was as if he had just realized that he was talking to someone and that someone was a comparative stranger.

Blacklaw was faintly aware that there were no more sounds coming from the far desk. He got the impression that the dark, wiry man was peering at them curiously.

A little unsteadily Harborford got to his feet.

"I am sorry," he said, "but this has rather disturbed me. If we could continue the interview at some other time—?"

"We spoke of possibly having another session tomorrow," Blacklaw suggested easily.

Harborford nodded in relief. "That would be better," he said. "Much better."

As Blacklaw went out, his last backward glimpse was of Harborford's bullet head hung broodingly over the tracing.

The press of unexpected work delayed the interviewer's return an additional day. When he entered the workroom, Harborford was sitting with bowed head at his desk. Blacklaw got the eerie impression that he had stayed there in the same position, the whole intervening time.

Kesserik and Madderlee—a large sandy-skinned man, the director of the Institute for Thought Research—were standing by the far desk. They glanced around quickly as Blacklaw came in.

Harborford looked up. His haggardness was shocking. The tired eyes widened. He got up slowly, his hand heavily clutching the desk.

"Mr. Blacklaw? I am glad—"

In a dull sort of way he really seemed to be.

After they had sat down, he ap-

peared immediately to sink back into a deep and unpleasant reverie. Only his eyes showed occasional activity, peering sharply from side to side of a lonely road late at night. Involuntarily Blacklaw followed his glance. Of course there was nothing.

Kesserik and Madderlee quietly left the room.

When Harborford finally began to talk, it was in a fatigued and toneless voice, very low. Obviously any thought of an article for the *Newsbeam* was a million miles away. He might have been talking to the wall.

"I can't interpret that trace. I've tried every way and I've failed."

His full gaze fixed on Blacklaw's pearl-gray tunic, stayed there. He stopped talking. Blacklaw shifted uneasily.

"Mr. Blacklaw, would you kindly smooth out your tunic?" the scientist requested quietly.

Mystified, Blacklaw complied.

Harborford went on, "I've spent hours in the projectorium. I've got several repeats of the trace, but I can't catch the thought that goes with it. My own master-thought, and I can't catch it." Again he stopped and his eyes moved. "Mr. Blacklaw, would you mind shifting your chair a little? Your shadow on that globe— Thank you."

"But, surely," Blacklaw remarked gropingly, "just one thought— It can't be so important—"

Harborford slowly shook his head. "The mind must be completely bare. If only one door is left open for the unknown to slip through, it's as bad as a thousand. And this is a master-thought—my mind's final comment on my most important studies." He paused. "And it must be true. I've searched and searched for inconsistency indication and I can't find any.

"And I don't know what the thought is."

He looked hopelessly at Blacklaw.

Then his eyes started to move again.

As soon as Harborford had made himself decide to go home and get some sleep he felt better. After all, he couldn't stay at the Institute forever. And the workroom was beginning to get on his nerves. It was beginning to get too much *into* his mind, like a room in which a sleeper wakes and lies drowsily peering at the walls.

Of course it was hard to admit even temporary defeat, even harder perhaps than he tried to pretend to himself. But it was no use trying to go on fagged like this. Already he had caught Kesserick and Madderlee giving him queer glances. If only that interviewer fellow had known more about thought-research—somehow he could talk to him. He wished he had stayed longer.

He lingered, puttering aimlessly. Averting his eyes, he arranged the tracings on his desk in neat, meaningless piles.

He was getting middle-aged, he realized. He couldn't stand up to a strain like this as he had once been able to—as when, in a sanitarium bedroom, he had fought the

black-shrouded mind-devils.

He shut the door on that memory, leaned against it.

His wife must be worried about him, he told himself. She couldn't have missed the anxiety in his voice when he had called to tell her he was working overnight.

And he really needed the security of home very badly.

Still he lingered by his desk, shifting from foot to foot.

Then he noticed that, with the sunset, shadows had grown in all the corners, were sprouting like vines across walls and floor. Vines all of one peculiar shape.

His footsteps across the room and down the corridor had the rapid, plunging rhythm of panic.

One of the Institute's private jetters was waiting outside with a pilot. But now that he was in the open air, Harborford again delayed, looking around at the panorama, broken at a few places by towering skylons, of forest and low hills, soft in the sunset, trying to let its peace sink into him.

His eyes were heavy and aching with fatigue. He experienced an illusion with which he was familiar and which did not frighten him. Across every object he viewed, as if faintly sketched in mist, was a gray pattern. Just as a person who thinks chiefly in visualized words may see objects accompanied by their names, so Harborford often saw them long with a ghost of their thought-traces.

Another thought-trace tried to creep into his mind—an uglily humped one with five subordinate undulations apparent to the expert, and jagged spindles toward either end. Redfield Indications and Harborford-m Halo very marked.

He suppressed it.

He decided that a little of the peacefulness of the landscape was filtering through to him.

Then he noticed darker shadows marching down the hills below the sunset's line of fire, collecting at the edge of the forest, lurking among the trees, gathering strength for a final undulating rush at the Institute. An army of humped shadows, all alike.

He ducked into the jetter. Almost with the first smooth upward swoop, fatigue got in its hammer-blow. He slept.

The soft shock of landing awakened him with jangling nerves, his mind refreshed too soon.

He told himself it was good to get home.

He thanked the pilot and went inside. His wife greeted him with hardly a trace of anxiety. She knew that he liked her to be very calm and untroubled.

He told her nothing. They talked of inconsequential matters. He began to absorb the feeling of home into him. He began to feel safe.

Halfway through dinner he noticed something repeated at regular intervals in the restful wall-pattern of leaves and branches. An uglily humped curve in one of the twigs.

He got up and left the room.

His wife followed him to his study. She no longer concealed her anxiety. He felt her arm around him, her cheek close to his, the

touch of her lovely hair, graying now.

"What is it?"

He felt close to her. He almost felt he could tell her about it. In fact, he turned and started to.

Then he saw, in the smooth pile of her gray hair, a certain pattern.

That did away with any possibility of confidences. Though they talked for a while in a general way —and at a distance—of his fatigue and need for some sort of vacation.

Being cooped up alone all night in his study was hard. Harborford wished he had not slept in the jetter. But at least the walls were unpatterned, and there was enough light to kill almost all shadows. He wanted to get out his pipe, but that would mean twisting curls of smoke. When he tried to read, weariness made the projected letters run together suggestively.

His mind was abnormally active. It kept visualizing the universe, the world, the past, his life, his researches, his thoughts and their traces. Everything clear as crystal, except for one inscrutable, humped trace that wriggled through them all.

Toward morning he got a little sleep.

He awoke feeling a little more detached. He could see plainly now that he really needed a vacation. He had been plugging away too uninterruptedly at his research. He needed a day of idle roving, free from routine and the sense of driving purpose, time to let his mind run down. Perhaps several days.

It was exciting getting into his flying togs. He hadn't had them on for over a year. He recorded a brief message for his wife and got out before the dew was off the grass.

He gunned his field and the house dropped away as if slipped under a giant's reducing glass. He felt, exhilaratingly, the weight of his blood in his veins and his flesh on his bones. He plummeted up a thousand feet and hung.

The landscape stretched out soft and greeny-gray and faintly hazed, as if still drunk with sleep. In the distance streams of workers were swirling toward the skylons, but here the air was clear.

He had forgotten how good it was to stand on air.

Inland, rolling hills stretched off enticingly toward a horizon mysteriously veiled with low lacy clouds. He headed toward it.

Then in a moment he had swung around in a close, racking semicircle and headed for the sea.

The low lacy clouds had all been of one shape.

A few minutes of blind plunging flight put him over water. He could look down and see shoals of fishes, distinct in the clear depths, and—off to one side—an all-media craft exuberantly porpoise-plunging.

He kept on like a rocket that doesn't know whither or why.

This way the horizon was clear. The low sun turned the long ripple edges into rosy veins. A maze of curves.

All alike.

Just in time he reestablished con-

trol over his actions and came out of his breakneck plunge to drift gasping a few yards above the fishes, who scattered from his shadow.

With the suddenness of a revelation, he realized that the whole idea of a vacation had been a mistake. He must get back to the Institute and lick this thing.

As soon as he had made the decision he felt better. The features of the landscape no longer took on shapes that weren't there, as he streaked steadily along. They stood out sharp and real, what they should be and nothing more.

He stripped off his togs and hurried to the workroom without seeing anyone.

He eagerly picked up the first tracing on his desk and stared at it.

He continued to stare at it.

He threw it aside and snatched up another.

And another.

And another.

Black and gray, large and small, dim and distinct, singly and grouped, memory traces, sensation traces, unconscious traces, deduction traces, synthesis traces, writhing, marching, crowding, as if there were no other thought in the whole universe—it was everywhere. That one humped trace.

Kesserik and Madderlee heard the crazy noises and the fall, and came running.

"Then it's fairly certain he will recover?" Blacklaw's voice expressed concern.

"Absolutely." Madderlee's nod was reassuringly emphatic. "He should be out of the sanitarium in a month. Though whether he'll ever return to thought research is quite another matter, since his breakdown seems to have been linked up very intimately with some phase of his work." He glanced curiously at Blacklaw, and Kesserick did likewise. "We're hoping you'll be able to throw some light on that point."

The three men were sitting in the workroom, near Haborford's desk.

Blacklaw hesitated. He said, "Ordinarily you'd be in a position to know much more about it than a comparative stranger like myself."

"Ordinarily. He was not a secretive man. But those last two days—" Madderlee threw up his hands.

Blacklaw addressed them both. "How much do you know?"

Madderlee looked at Kesserik.

"Very little," the dark assistant replied rapidly. "He was very much concerned about some point in his work. We spent forty straight hours here and in the projectorium, mostly taking tracings of his thoughts. He wouldn't tell me what he was after and he didn't give me a chance to examine the tracings. I got the impression he was apprehensive about something. Then he went home. Early next morning he came back and—it happened."

Blacklaw looked at Madderlee. "Did he tell you anything when you saw him yesterday?"

"Only that he would never again have anything to do with thought research. They didn't let me talk with him much, but he was very eager to tell me that. I'd intended suggesting that we take tracings to help in analyzing his case, but his attitude pretty well ruled that out."

Blacklaw turned to Kesserik. "Did you examine those last tracings afterwards?"

"Of course. But they were strangely unhelpful. A lot of thoughts concerning his research and special cases. Marked tension indications and neurotic groupings. But nothing to give me a definite line on what was causing him such anxiety."

Blacklaw stood up and moved behind the desk. "Well, gentlemen," he said, "Harborford *did* tell me a little more than he revealed to either of you. It's my idea that he became obsessed with one of his own thought-traces which he couldn't interpret or consciously recognize."

Kesserik pursed his lips, smiling queerly. "Hm-m-m—barely possible, I suppose. Though I wouldn't think you'd ever get the old boy to admit it."

Madderlee asked. "What trace? You've looked through those on his desk. He had them scattered all over the place when the seizure occurred. Were you able to recognize it again?" he sounded skeptical.

Blacklaw nodded. "Solely because it was identical with a pattern in one of my own thought-tracings, which Harborford made to give me a demonstration. The same circumstances enabled me to make an amateur's stab at interpreting it."

He picked up the top tracing and handed it to Kesserik, indicating a misty, humped curve.

The assistant scanned it intently, then shook his head and broke into a smile, letting the tracing slip to his knee. "No, Mr. Blacklaw, you must be mistaken. This trace could never have puzzled Harborford for a moment. Why, even I can interpret it, and without any reference material." He picked up the tracing. "It's simply—"

"Wait a minute," said Blacklaw. "If my idea is right, it *is* a trace whose meaning would be very obvious to any thought-research man—except Harborford."

He took a few steps. "I know I'm just a layman," he said, "and what I'm going to say is not at all original, but it's something you fellows probably lose sight of at times, because you're so close to your work.

"Thought is different from every other object of man's research. Stars, atoms, amoebas, even body cells—they're all outside the mind. But in analyzing his thoughts, man is analyzing his own analyzing apparatus. So it always stays one jump ahead of him.

"Let's suppose there was a scientist who knew everything, who understood the whole universe perfectly. Well and good. But then who would understand the scientist? *He* couldn't, because his own understandings of himself would constitute new data requiring analysis. He couldn't ever get ahead of the game."

Madderlee and Kesserik were obviously interested, though they still looked skeptical.

"When Harborford claimed to be able to catch any thought, he was putting himself in the place of that hypothetical scientist—and *without* understanding the whole universe by a long shot. He claimed to be able to keep ahead of the game. He thought he had his thoughts all neatly taped and docketed, and for that affront his thoughts took a revenge—a rather nasty one, because it was so simple.

"He found the trace of a thought springing from his research. It was a master-thought—his mind's final comment on his life's work. There was no evidence of illogic or inconsistency in its pattern—he couldn't get rid of it that way. So, because it was a thought which knocked all his arrogant claims into a cocked hat, he tried to suppress it from his consciousness. He refused to recognize its meaning—and as a result it became an obsessive shadow which terrified and eventually overwhelmed him."

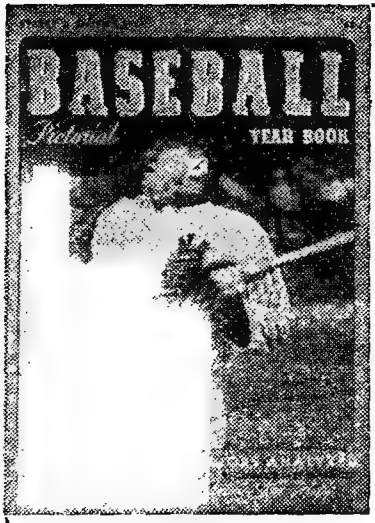
An odd thing happened. Matterlee still looked skeptical but Kesserik's attitude had changed completely. He was nodding excitedly.

Blacklaw said, "It was a simple thought. You and I wouldn't have found it in the least unusual or frightening. But I want you to put yourselves in Harborford's position. A man with an almost frantic hatred of any dark corners in the mind, a man who had spent two years in a sanitarium and had an overpowering fear of anything abnormal or hidden in his thought processes, a man who had staked everything on his ability to lay his mind completely bare . . . and then for that man to find in his mind, springing logically from its experiences, this thought of all thoughts."

He paused. "You interpret it, Kesserik."

Kesserik looked at the trace and read: "There are thoughts in your mind that you will never catch."

THE END.



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In Times to Come

Isaac Asimov, as has been mentioned here before, is fairly busy on more vital duties than spinning yarns of the far future. He's trying to help assure a more immediate future. But he does get some free time. Somewhere he found enough to do another Foundation story—which, judging by requests received, should be pleasant news. This one is titled "The Big and The Little," and concerns the battle between atomic generators—generators, on one side, that towered six stories high, could throw a defensive screen around a planet, move an asteroid, or incinerate a world. On the other side, the generators were—for lack of the necessary raw materials and resources—walnut size things, devices that could throw a defensive screen around one man, move an automobile, or make a kitchen paring knife of atomic force. The battle between the giants and the midges could have only one final conclusion—as you'll realize after you've read the yarn.

Did you find Raymond F. Jones' set-up in "Renaissance" in this issue interesting? Next month's installment will make the whys of that situation a lot clearer. The original concept of Kronweld was scientific, extremely sound, and well planned. The thing that ruined the whole magnificent plan was the unsuspected presence of the radiations in Kronweld that made human birth impossible there. But the plan—? Sorry we couldn't run it in one piece, but it's over 100,000 words long—more than one full issue of the magazine!

The Editor.

THE ANALYTICAL LABORATORY

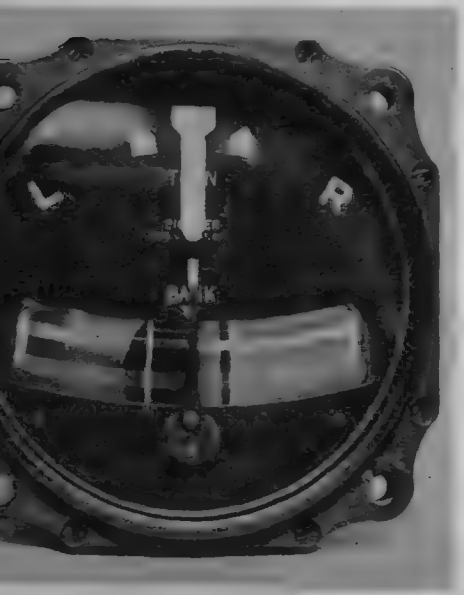
There was a fairly heavy vote on the April issue, and a quite consistent choice—particularly as to first place as against places two and three, and four, five and six. Properly, it might be said that #1 was "The Changeling"; # 2 and #3 were "The Long Way" and "The Bureaucrat," with the edge going to "The Long Way"; and #5 and #6 almost split between "Lobby" and "Invariant." The exact scores were:

Place	*Story*	*Author*	*Points*
1.	The Changeling	A. E. van Vogt	1.80
2.	The Long Way	George O. Smith	2.65
3.	The Bureaucrat	Malcolm Jameson	2.75
4.	Sanity	Fritz Leiber	3.6
5.	Lobby	Clifford D. Simak	4.8
6.	Invariant	John Pierce	4.9

Sense of Direction

Sperry Gyro

The simplest imaginable mechanism —but it has a sense of direction that can guide ships at sea—or in space!

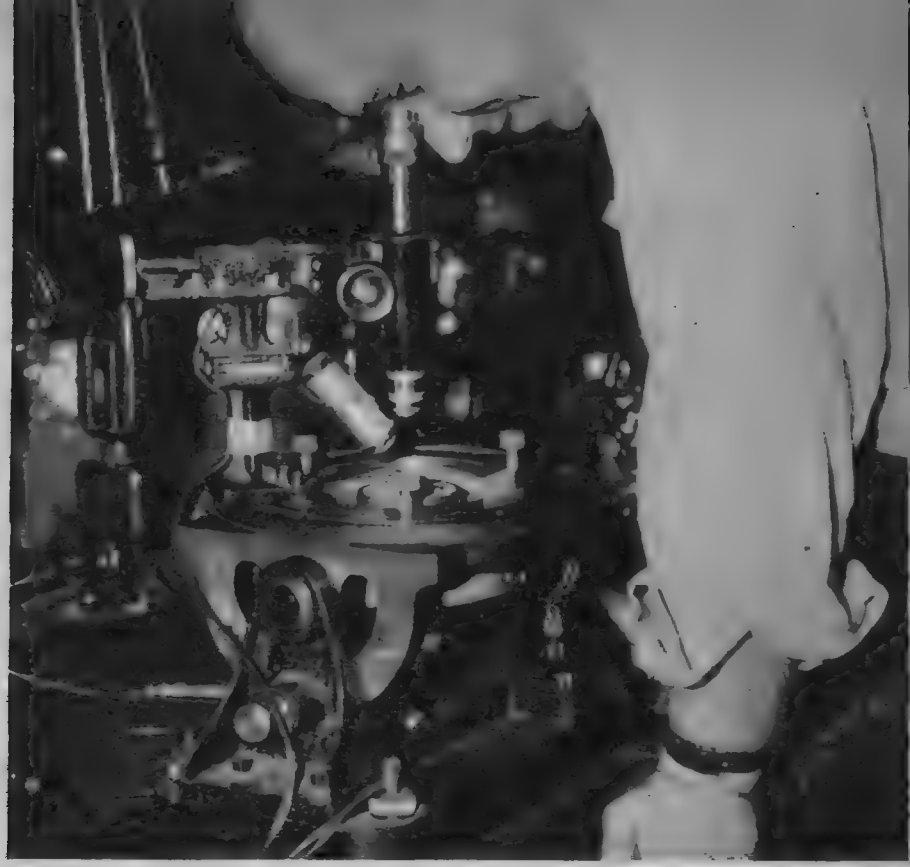


Sperry Gyro

The aircraft turn and bank indicator uses the gyro to supply an up-and-down sense fog can't confuse.

Of all the things known to man today, only one has an inherent sense of direction; the gyroscope is enormously valuable to men today because it, and it alone, can furnish mechanism with an infallible sense of orientation. The magnetic compass needle has a secondhand directional sense, in that it tends to align itself with the lines of force of Earth's magnetic field, but that magnetic field is north and south only under exceptional local conditions. In far north-central Canada the compass would, as a matter of fact, serve nicely to indicate up-and-down, but certainly not north and south.

A gyro's tendency to maintain its axis of rotation always in the same line can be used in innumerable ways. If forced to change its axis of rotation, it reacts in a peevish twist at right angles to the force applied—and doesn't yield to the actual motivating force. The stability of even a small gyro is startling; a six-inch, ten-pound gyro can effortlessly deflect the efforts of a powerful man—can, if it is spun swiftly enough, support several tons of load. The gyrocompass, used in all submarines and warships of major size, and in many merchant ships, is dependent on one small gyroscope, and one very, very large one. The small one is mounted in special trunions, with multiple electric relay contacts, on the large one—the Earth. There is one, and only one axis of rotation which the compass gyro can assume without being disturbed by the Earth's rotation—its axis therefore seeks and



Sperry Gyro

The gyro wheels must turn at extremely high speeds for maximum stability. The accuracy of manufacture, perfection of balance and trueness of bearings must be maintained at an equal extreme of high precision quality.

finds a line of rotation exactly parallel to the Earth's. The short-time bouncing, swaying, pitching, weaving, rolling and yawing of a ship it can, and does, simply ignore; the steady, irresistible, single-minded urge of the Earth's rotation makes it assume the one possible line of no interference. The gyrocompass thereafter points true north and south so long as its rotation continues.

The gyrocompass is not suitable for use in airplanes, unfortunately —nor is the magnetic compass. Planes carry too much massive steel, electrical lines, and move from one magnetic zone to another too rapidly for easy or dependable magnetic compass work.

Planes have for some years used gyroscopes in several forms, however. First was the turn-and-bank indicator; Man's own up-and-down sense is a wonderful thing, but has a nasty habit of going completely crazy when flying in a fog. A gyro never can see anyway; a small gyro

The marine gyrocompass points true north, not magnetic north, and works equally accurately in a submarine, a battleship, a freighter loaded with highly-magnetic tanks, or a non-magnetic ship—but not in planes.

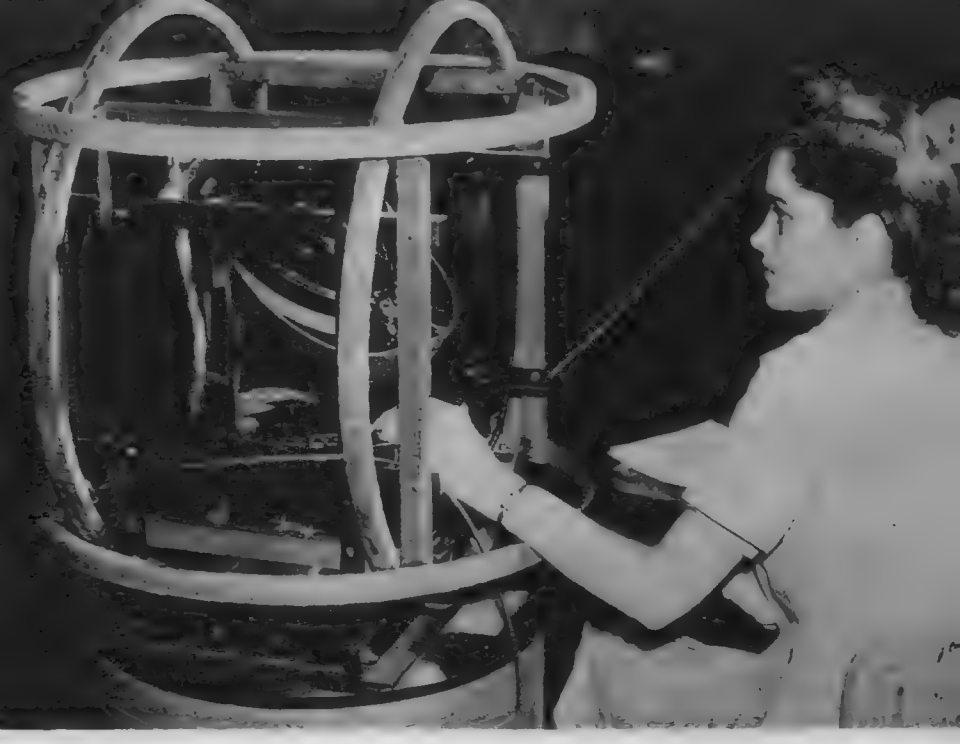
wheel, started spinning on a vertical axis in freely turning gymbals, will stay on that vertical axis no matter how the plane may pitch, roll, or turn about it. A pendulum will, of course, point downward too—but if it once gets rocking back and forth it goes crazy and stays crazy; a gyro simply holds stubbornly to one line of direction.

The directional gyro has been a standard aircraft compass for years —a compromise between a gyro-compass and the magnetic compass, in a way. It was simply a small, heavy, freely suspended gyro which could be started rotating, pointing its axis of rotation in the direction the pilot intended to go. Every now and then the pilot changed the direction of directional gyro—because the plane flies a great-circle course, not a straight line. And the directional gyro, with its mind on the far stars, maintained a darned good approximation of an absolute direction. It might be pointing parallel to the Earth's surface when you started, but if you left it unchanged for six hours, it would be pointing straight up—same direction.

"George," the automatic pilot, had sense-organs consisting of a fine collection of variously oriented gyroscopes—and a resultant sense of orientation so fine no human pilot could match the steadiness of automatic flight. (Though George was just a little stupid about getting the hang of a great-circle course. George liked straight lines.)

What was really needed was something with the steadiness of the directional gyro, but something that would keep the Earth in mind, not simply point at some location on the far side of infinity. The magnetic compass was fine for that —it not only kept the home planet in mind, though; the darned thing nodded to every iron-ore deposit, dense rock formation, and in general behaved like a dog on a leash —going from here to yonder all right, but yearning toward all points of local interest on the way.

The new Gyro-fluxgate compass, a Bendix product, hitches a gyro



Bendix

Testing the new Bendix gyro-fluxgate compass in a test-rig that, by means of the large electromagnetic coils, creates a complex magnetic field acting in any direction or combination at will. They can be used to exactly cancel out the Earth's magnetic field within the test-rig to make basic adjustments.

to the magnetic field to hold it steady when the plane moves violently. Instead of using a magnetic needle, it uses a highly ingenious sort of transformer. The efficiency of a transformer decreases rapidly if the transformer core becomes saturated, or partly saturated with DC magnetic fields; permalloy is a magnetic alloy so easily magnetized that it is readily and markedly affected by the Earth's magnetic field. Hence a transformer with a permalloy core will be considerably less efficient if the core is north and south—magnetic—than when it is east and west. The actual intensity of Earth's field varies widely, but if three such transformers, mounted in an equilateral triangle, are used to feed a vacuum tube amplifier, the ratio of the current produced in each transformer rather than the absolute value thereof will give the information as to the relative orientation of the Earth's field and each of the three units. The ratio will depend solely on direction, uninfluenced by absolute intensity. The output of the vacuum tube amplifier can give the indication on one or a half dozen instruments.

THE END.

Headstones for Astronomers

by R. S. RICHARDSON

***And,** naturally, on an astronomical scale—the craters of the Moon, bearing the names of astronomers. But unlike ordinary headstones, some of these bear the names of living men.*

Photographs from the Mount Wilson Observatory

Perhaps you can recall stories about the Moon that read something like this:

"It was with the calm resignation of despair that Alan Dink, the androidal robot, surveyed the wreckage of his spaceship. The anterior portion was completely shattered where the blunt nose of the craft had burrowed into the walls of the crater Copernicus," or, "Stop them at any cost!" cried Captain Fury. "Set off the lunar flare on Tycho if need be!"

Always it is the same old craters that are used for landing points over and over again—Copernicus, Tycho, and Plato. But if science-fiction really wants to be up-to-date—and certainly stories of the future should at least keep even with the present—spaceships landing on the Moon should come to rest near such craters as Schiaparelli, Benjamin Franklin, and Mary Proctor. For the Historical Section of the British Astronomical Association has just issued a report entitled "Who's Who In The Moon" containing the official list of the names of lunar formations. Not only are all the old names there but in addition scores of modern ones mingled with those of classic antiquity.

The Moon has long been regarded as the graveyard of astronomy owing to the custom of

The southern portion of the Moon, age twenty-six days, as seen in the 100-inch Mount Wilson telescope—not an air photograph of Berlin!

The region of the Moon near Tycho with a few of the named craters labeled. There are craters enough, of all sizes, to supply several more generations of astronomers. Probably meteors are causing more even now.

Copernicus and Eratosthenes got in early; the size of the crater named for an astronomer tends to indicate chronological place rather than his importance. But for whom will the greatest craters of the unseen side of Luna be named?

The Moon. We can name the craters; we can be fairly certain that the craters are the splashes of meteor impacts. But a wholly satisfactory explanation of the vast, almost perfectly smooth "maria" is still missing.

naming the various formations after noted astronomers of the past. Certainly it is ideally suited for an eternal resting place for no one could wish for a more quiet site than the calm surface of the Moon with a little crater for a headstone. In fact, some astronomers have even gone so far as to select their crater well in advance to make sure there would be no slip-up after their demise!

The custom of naming the craters after scientists and other learned men originated with Langrenus of Brussels who published a map of the Moon in 1645. Six years later appeared the great lunar chart of Riccioli of Bologna who developed the system of Langrenus of naming craters after medieval and ancient astronomers as well as his contemporaries.

Riccioli laid out his lunar cemetery in an orderly manner by grouping the men together who were alike in their studies and time. For example, in the north we find Plato surrounded by his friends and pupils, while in the south Tycho Brahe is similarly accompanied by his disciples. Since Riccioli was an ardent admirer of Tycho's he assigned him one of the most conspicuous craters which is so bright as to be visible to the naked eye at the full phase. Moreover, Riccioli believed in Tycho's planetary system as opposed to that of Copernicus even to the extent of throwing the Earth-Movers over into the Ocean of Storms, virtually making mere floating islands out of them. But he must at least have admired Copernicus personally for he awarded him a splendid crater that is almost as prominent as the one he named after Tycho. Riccioli named another fine crater after his friend Grimaldi and gave his own name to a little one near by.

Later selenographers got into the habit of naming craters after each other as well as adding new names occasionally as their fancy dictated, until by 1900 the face of the moon was in a state of hopeless confusion. By 1935 the International Astronomical Union decided something ought to be done about the situation with the result that the final official list of six hundred nine personal names applied to the lunar formations is now available. Attached to each name in the catalogue is a brief biographical note that greatly enhances its value.

Glancing through the names is an amusing occupation in itself. Do you remember the scene in Jules Verne's "Trip to the Moon" where the projectile was passing over the crater called Hell? For the last thirty years I had naturally supposed that this crater was named after the infernal regions. Today I discovered that the name refers to Maximilian Hell (1720-1792), "a Jesuit priest, also well-known as Father Hell, who became Director of the Vienna Observatory, and discussed the supposed discovery of a satellite of Venus, though he was never convinced of its existence."

Eight women have been assigned craters in all. One is Maria

Northern portion of the Moon, showing the sharp contrast of pitted, ragged craters and the vast, smooth "maria." Just above and left of center is one that might be called a small maria or a large crater—but the bottom has the lakelike smoothness of maria. Fusion due to impact, possibly?

The south-central portion of the Moon. Just to the right of center is another lunar mystery—"The Railroad," the straight, long line across the smooth surface. At certain angles of illumination, the shadows thrown by the sun show this to be a wall-like, flat-topped something. Cause unknown.

Mitchell (1818-1889), Director of the Vassar College Observatory; another is Catherine Wolfe Bruce (1816-1900), noted for her many gifts to astronomers, also honored by having the asteroid Brucia named after her.

Among distinguished astronomers of the United States whose names can now be found on the lunar maps are those of Burnham (1838-1921), the famous double observer; Asaph Hall (1829-1907), discoverer of the satellites of Mars; Simon Newcomb (1835-1900), who investigated the origin of the asteroids and the motions and masses of Uranus and Neptune; and G. W. Ritchey (1864-), who figured the 60-inch and 100-inch mirrors of the Mount Wilson Observatory and built the Ritchey-Chretien telescope of the Naval Observatory.

Two business men who founded large observatories have been honored by craters. James Lick (1796-1876), who made a fortune in California in various enterprises, lies buried under the pier of the 36-inch refractor of the Lick Observatory. Near Lick's crater in the Mare Crisium is that of Charles T. Yerkes (1837-1905), a wealthy traction magnate, who donated the funds for the 40-inch refractor of the Yerkes Observatory of the University of Chicago.

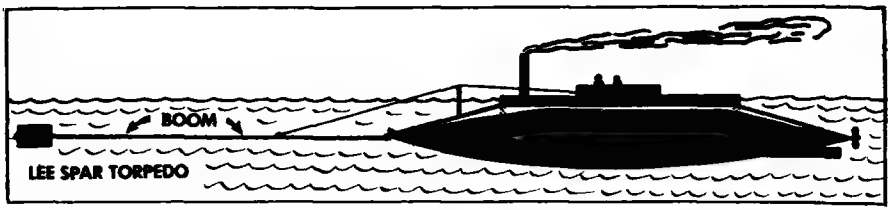
The size of a crater is by no means proportional to the fame of the man whose name it bears. Thus Isaac Newton is a tiny marking so close to the south edge of the disk that it is scarcely visible at all. The trouble is that all the good craters were taken long ago so that famous astronomers of the present and future will have to be satisfied with insignificant craterlets their relatives will barely be able to discern under excellent seeing conditions. But perhaps space travel will open up a whole new vista of headstones on the side of Diana eternally hidden from the earth.

THE END.

ORIGINS AND SPECULATIONS

Since their first discovery, the craters of the Moon have been a subject of speculation. The natural, original assumption was that they were volcanic craters, but when measurement of their extent became possible, this explanation failed flatly. Volcanoes don't have 200-mile-diameter throats. After several centuries of study and speculation, the cause of the craters seems fairly positively established. Exact scale-model duplicates can be produced by dropping a spoonful of an extremely fine powder, such as cement or plaster of Paris, onto a smooth bed of similar powder from a height of several feet. The pebble-thrown-into-mud system doesn't produce exact duplication, though a fair approximation, because of the strength-of-materials ratios. The pebble has mechanical strength enough to resist such a puny impact—but even the enormously tough nickel-iron of meteoric matter can't offer appreciable resistance to a 20 to 60 miles-per-second impact into the rocks of the Moon. Similarly, the spoonful of loose powder has no appreciable mechanical strength, and reacts, in scale-model experiments, as the actual meteor would. Some lunar craters have small peaks at their centers; this effect can be produced by altering the height of fall of the spoonful of powder, and by variations in the depth of the powder.

By dropping white plaster of Paris onto gray cement, an analysis of the resultant distribution of meteoric matter and blasted rock can be made. The result checks nicely with the known distribution at Meteor Crater, Arizona.



The Lee spar torpedo in action position. Theoretically—but not so practically—the extended spar kept the explosion from sinking the attacker.

"Torpedo!"

by WILLY LEY

***Torpedoes** aren't so very old—that is, workable ones. But the idea is as old as gunpowder. And "torpedo" didn't always mean a miniature submarine full of explosives; it used to be what we call a naval mine. When the self-propelled torpedo was made, it had many rivals, with weird and wonderful drivers!*

It is purely an accident of linguistic development that we speak of an attack by torpedoplanes instead of an attack by Whitehead carriers, and that a submarine commander reports he put two torpedoes into an enemy vessel, instead of two Whiteheads.

Such a development would have been possible. We are speaking freely of "Diesels" when we mean Diesel engines, and refrain from calling Tesla transformers "Teslas" merely because they are rare. We have a tendency to call any German airship a "Zeppelin," while the Germans, on the other hand, do call any airship by that name, whether German or not, whether of the real Zeppelin type with internal skeleton or not. And in any language but English X rays are referred to as Röntgen Rays—in English this is the alternate name—ignoring the fact that Dr. Röntgen himself wanted them to be called X rays.

In the case of the torpedo the linguistic development turned a few particularly inexplicable corners. The word "torpedo" was introduced into military language by Robert Fulton to describe an explosive underwater charge, mostly in the form of a charge attached to a

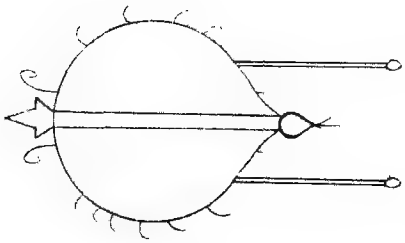


Fig. (A) The "self-propelling combusting egg" of Hassan Alrammah, proposed around 1280 A.D., was intended as a rocket torpedo. It may or may not have been actually built.

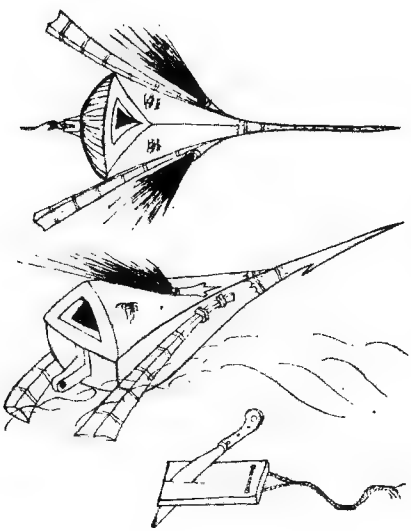


Fig. (B) The Italian military engineer Joanes de Fontana, in 1420, sketched this wooden rocket torpedo, camouflaged (!) as a sea-serpent. The dagger is intended to indicate the constructional material is wood.

long pole which was later termed the Spar Torpedo. But then torpedo began to mean a naval mine, Farragut's famous order "Damn the torpedoes—" really means "disregard the minefield."

Then the Scottish engineer Robert Whitehead invented the "model submarine" now known as torpedo. I don't know whether Whitehead himself proposed a special name for it, later it was usually referred to as "Whitehead torpedo" or "automotive torepdo." Meanwhile somebody had re-christened the stationary torpedoes into "mines" and the term torpedo was available. It went to the one type of "automotive torpedoes" which survived all tests of battle, the Whitehead.

The sentence implies that there were other forms of automotive torpedoes in use or at least under consideration. The implication is correct, there were. Plenty of them. Some of them were failures even on paper. Others reached the experimental stage and misperformed. Again others were even introduced into service in various countries. But all of them failed in the end, except for the one lonely survivor of the inventive nineteenth century: the Whitehead.

The Whitehead was invented in 1863 or in 1865, depending on whether you want to use the year of completion of the first model or the year during which the work on it was begun as the date of the invention. That first model weighed some three hundred pounds, carried a charge of eighteen pounds of cannon powder and developed a

"speed" of 6 m.p.h. It took quite a number of years until the speed and the range had been increased to a useful magnitude, and it was this period during which most of the rivals of the Whitehead made their appearance.

To very many people Whitehead's first fish torpedo, as it was also called, was not the prototype of a weapon which would later attain enormous power and efficiency, of a weapon on which the outcome of a war might hinge. To them the first Whitehead merely proved that it could be done, that the problem of endowing a naval mine with motive power of its own could be solved. Naval authorities and rival inventors alike subscribe to the idea, but that did not imply that they also subscribed to the mechanical design.

But before we go on it might be useful to describe a present day torpedo, the fully developed Whitehead, in outline. It is about eighteen feet long and twenty-one inches in diameter and consists pricipally of two parts, the "head" and the body. There are several types of "heads," one type which is used for target practice, another type which is used for testing the machinery of the torpedo, and, finally, the "war head," containing around five hundred pounds of TNT.

The larger part of the body is simply a container for compressed air. It is essentially this air which drives the turbine which, in turn, drives the two propellers which rotate in opposite directions and furnish the torpedo with a speed of about 40 m.p.h. In order to increase the expansion of the air it is heated by injecting a small quantity of fuel—fuel oil, gasoline or alcohol—into the air stream and burning it. And in some types a thin stream of water is injected, too, for the purpose of producing steam and thus increasing the volume and pressure of the gaseous mixture still more. Then there is a depth-setting gear which keeps the torpedo at the depth for which it has been "set" and a stearing gear which maintains its direction. (A late German wrinkle is the addition of an acoustic steering device the value of which is doubtful in spite of some successes.)

This, then, is the modern torpedo, the first prototype of which made its first trial run in 1865.

All the essential features of the original invention are Robert Whitehead's even though the idea had a short and still somewhat obscure prehistory. Whitehead, who then resided at Fiume, had not been interested in torpedo warfare originally, until he was approached by an Austrian army captain by the name of Luppis. The story is usually told in about the following words: In 1863 Captain Luppis approached Whitehead with plans relating to torpedo design, trying to interest the practicing engineer Whitehead in torpedo warfare because he felt that he, Luppis, did not know enough about mechanics and engineering to carry those plans out. Whitehead then went to work and the torpedo was the result. It

was even called the Whitehead-Luppis torpedo on occasion, so that Luppis would not be without honor.

The latter is a meritorious thought, but it implies that the plans brought by Luppis were his own and that the Luppis plans were actually the plans of the later Whitehead torpedo minus mechanical niceties.

Actually the ideas which Luppis brought to Whitehead were plans for a surface torpedo, an explosive-laden small boat propelled by an unspecified type of engine. Besides Luppis acted only as an intermediary, those plans he brought to Whitehead had been found among the papers of a deceased—and unnamed—fellow officer of the Austrian *Marinebatterien*—coastal batteries. Whitehead took the all-important step of converting the model boat into a model submarine. It is quite likely that Luppis mentioned this possibility, the idea of a model submarine was then under much discussion because of a rather spectacular demonstration. A Bavarian noncommissioned officer by the name of Wilhelm Bauer had conceived the idea of a submarine some time earlier and had even built a small submarine boat which sank on its trial run. Next he had built a clockwork driven model with which he traveled around. That model submarine had been demonstrated on March 11, 1852, at Trieste in the presence of the Emperor of Austria.

Wilhelm Bauer later built a rather large submarine for the Russians, until that *Podvodnaya lodka tchort*—Russian for "submarine devil"—actually performed there were many voices stating that submarines could not work. But that a model submarine was possible could not be doubted after that demonstration at Trieste and both Luppis and Whitehead must have known about it.

Between the completion of the first Whitehead and its first use in battle there elapsed some fourteen years. The date of the first actual use is May 29, 1877 when the British unarmored cruiser *Shah* discharged a Whitehead against the mutinous Peruvian armorclad *Huascar*. But the *Huascar* was fast for its time, runing all of eleven knots and it evaded the deadly torpedo by simply running away, the speed of the Whitehead having been improved to only nine knots at that time. By a strange coincidence the *Huascar* had been built in 1865, the same year in which the first Whitehead was completed. In 1941 the *Huascar* was still in commission—in the Chilean Navy—and it may still find its end by a Whitehead.

The first successful use of the Whitehead took place on January 25, 1878, when two Whiteheads fired from Russian torpedo boats sank the Turkish monitor *Seife* or *Seifa*.* The claim that this sinking was accomplished by means of spar torpedoes is probably based on the fact that most of the Russian tor-

* I advise against reliance on this name, the transcription of the Turkish name seems to have gone haywire. It sounds faintly Turkish but cannot be found in a dictionary. Nor would I take it as a translation of whatever Turkish word it originally was, since *Seife* means nothing in Russian and "soap" in German, an unlikely name.

pedo boats were armed with this weapon. But the sinking, according to contemporary Russian and German reports, must be credited to the then newly purchased Whitehead torpedoes of which the whole Imperial Russian Navy had about two score.

The main competitor of the Whitehead, as can be seen from these contradictory claims, was then still the spar torpedo, invented originally by Robert Fulton but then usually called the Lee Spar Torpedo because of an improved American Civil War version.

Such spar torpedoes had claimed

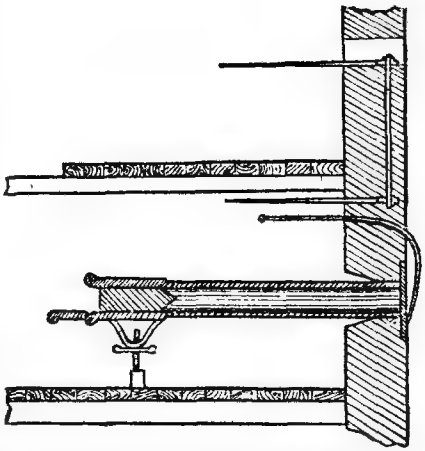


Fig. (C) Montgéry's sketch of underwater launching tubes for rocket torpedoes.

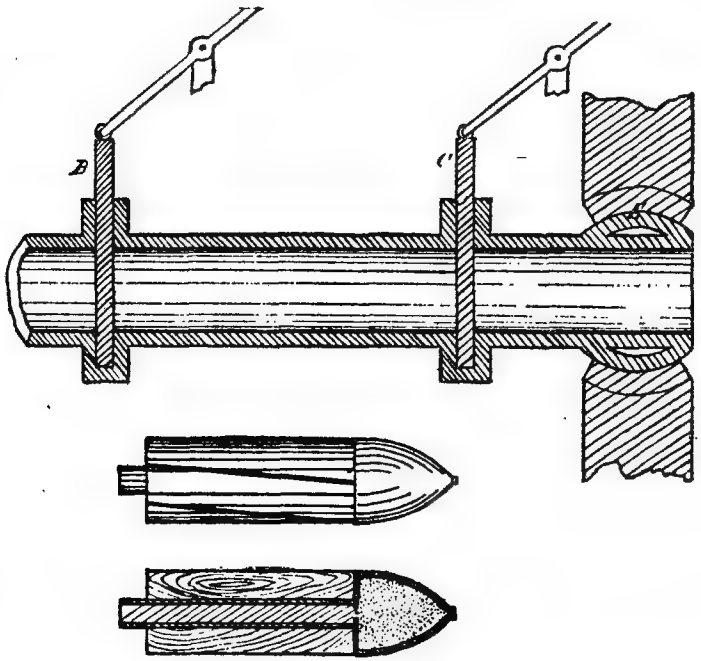


Fig. (D) Major Hunt's proposed underwater launching tubes and rocket torpedoes.

victims on both sides during the Civil War, most spectacular among them the *Housatonic*. It was sunk by the Confederate submarine *Hunley* and was, in a manner of speaking, the first ship to be sunk by a submarine. The term "in a manner of speaking" had to be inserted because that particular attack of the *Hunley* was not an underwater attack, even though the *Hunley* was a submarine. Since the *Hunley* had drowned at least thirty-five men during unsuccessful trial runs, the actual attack was made in an awash position and the weapon used was a spar torpedo. Both vessels were destroyed, but only the crew of the *Hunley* was lost, that of the *Housatonic* was saved because the sinking occurred in only twenty-three feet of water.

Originally the *Hunley* was to have used a towed mine, trailing some eight hundred feet behind. It was to approach the enemy in an awash position, dive under the intended victim and emerge on the other side, thus using the victim as a shield against the explosion of its own weapon. During experiments on inland waterways this had worked out nicely, several old barges had been blown up "according to plan," but the method failed to work on the choppy waters of Mobile Bay. The slow speed of the hand-cranked submarine was not enough to keep the line taut, there was considerable danger that the towed mine might strike the submarine towing it. For this reason it was discarded for the actual attack.

But the idea was too pretty to be forgotten completely. It cropped up again a few years later in a modified form as the "Harvey torpedo."

The Harvey torpedo, named after its inventors, Commodore Frederic Harvey and Captain John Harvey, was tried out in British waters in 1868. For a while there was considerable excitement about the new weapon, but it seems that that experiments did not work out quite as well as had been hoped. The

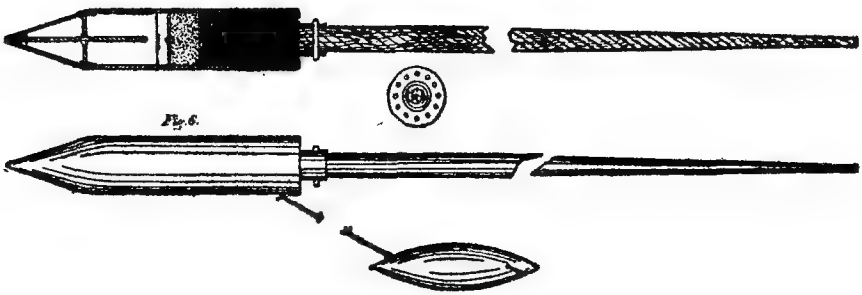


Fig. (E) Phillips, around 1870, proposed a towed torpedo—with a rocket doing the towing.

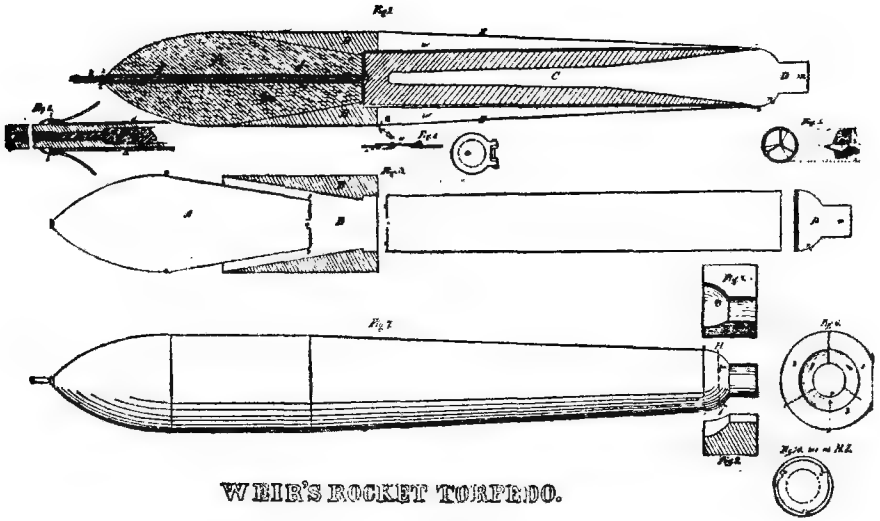


Fig. (F) Weir's approached the end of the rocket-propelled line of effort in torpedoes. Machine work was improving, making mechanical drive practicable.

Harvey system, or better, one of the Harvey systems since there were several modifications, can best be compared with the modern paravane. Each vessel was to tow two torpedoes, trailing some distance behind and away from the towing vessel. As long as the towing vessel kept a straight course everything went fine, the troubles began to show when it made a simple turn and they multiplied with the difficulty of the maneuver performed. And the more the tests progressed the more obvious it became that the cannons of the intended victim were likely to smash the towing vessel before it had approached sufficiently close.

The experiments were discontinued then, one of the contributing causes being the invention of the Whitehead which had been made three years earlier.

After that the inventors got really busy, creating at least a dozen rivals of Whitehead's invention. They cover a wide range of mechanical and physical principles, but for convenience they can be divided into two main groups: those based on the rocket principle and those of a mechanical or electromechanical nature. All of the latter came after the first Whitehead, many of the rocket torpedoes are of an earlier date.

Rocket Torpedoes

The first modern attempt to build a rocket propelled torpedo was made by a Frenchman, General Paixhans,

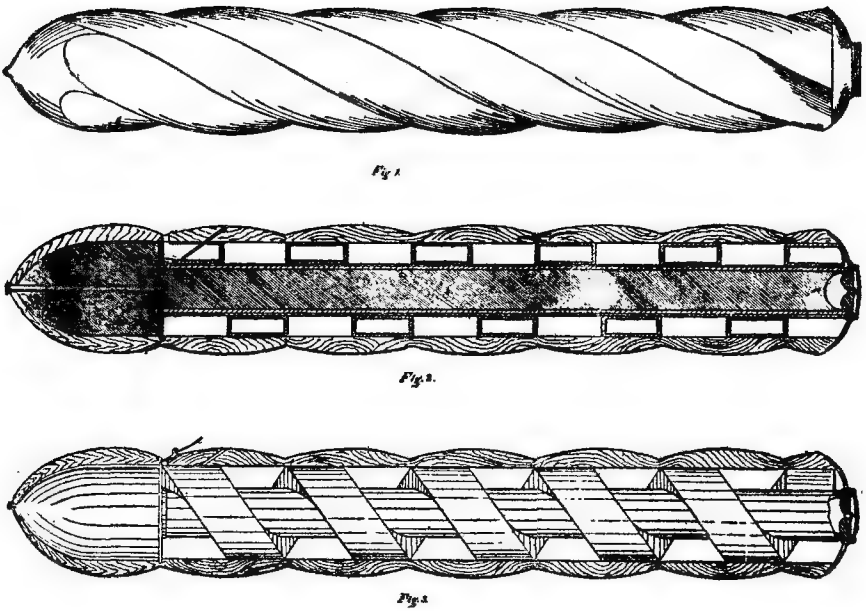


Fig. (G) Lieut. Barber's was the last of the important rocket-drive efforts.

in 1811. His torpedoes traveled at the surface, they were small boats propelled by powder rockets. In the bow they carried a large bomb with a short time fuse which was ignited by the rockets.

Paixhans' torpedoes traveled up to four hundred twenty feet in a fairly straight line and with high speed; apparently this distance was considered insufficient because the experiments were soon discontinued.

General Paixhans probably thought that his idea was completely new, actually it was only an unintentional revival of two older plans which were discovered by military historians several decades later. One of these two dates all the way back to Arabic times and to the Arab scientist Hassan Alrammah Nedshm Eddin—"Star of Faith"—who, around 1280, wrote a book in which a "self-combusting and moving egg" is mentioned. (Fig A) It was a flat container of incendiary matter, floating at the surface and propelled by two large rockets. The second-old plan was discovered in the notebook of the Italian military engineer Joanes de Fontana, written around 1420. It was a wooden surface torpedo, also filled with incendiary matter, propelled by rockets and kept on a straight course by means of a trailing piece of wood. (Fig. B) It was even camouflaged by painting two large eyes on its outer cover

so that it might be mistaken for the head of a sea monster.

Since it is unlikely that anyone of these older plans was actually tried out, Paixhans may still be given the honor of having been the first to experiment along these lines.

The next rocket torpedo, in chronological order, was an American invention about which, however, nothing definite is known. According to Lieutenant F. M. Barber, U.S.N. of the U.S. Torpedo Station at Newport, R. I.:*

> In 1823 an American, named Joshua Blair, is said to have submitted to a committee the project of his "American torpedoes," which were large rockets fired under water for the purpose of penetrating or destroying vessels. Who the committee were was not stated in the account I have seen, but they are said to have reported favorably on the project.

Two years later, in 1825, Captain Montgéry of the French Navy published in Paris a book with the title *"Traité de fusées de guerre"* —"Treatise on War Rockets." It dealt mainly with the British war rockets of Sir William Congreve and their continental imitations, but it also dealth with rockets for naval warfare. Montgéry drew upon an experience of another Frenchman, Dr. Desaguliers, which the latter had had in about 1730, just about a century earlier.

Desaguliers, living as a refugee in England, had joined a party making a boat trip on the Thames. When it grew dark they amused themselves by burning fireworks, colored lights, stars, sky rockets and so-called water rockets. The latter, which are no longer customary, consisted of a rocket tube filled with alternate layers of ordinary rocket composition and of a weak mixture which only sustained the flame. The end of the tube contained a small explosive charge supposed to produce a loud noise and a piece of lead so that the tube, when thrown into the river, would float vertically. The effect of these water rockets was very amusing. The first layer of powerful rocket composition forced them to dive. When the weak layer burned they reappeared elsewhere at the surface, dived again, reappeared again and so forth several times until finally the "noise charge" exploded.

Desaguliers met with the misadventure that the noise charge of one of these water rockets exploded under one of the small pleasure boats and promptly blew a big hole into the bottom. Astonished by this incredible display of power Dr. Desaguliers began to think about underwater explosions and realized that the hull of any ship always has to be the line of least resistance. It is this principle upon which all underwater charges, mines, torpedoes and depth charges, are based.

Montgéry knew about this adventure and about Desaguliers' conclusions. Consequently he toyed with the idea of building such water rockets on a larger scale and tossing them among enemy vessels by means of a mortar. But he soon realized that the moment of the ex-

* "Lecture on Drifting and Automatic Movable Torpedoes, et cetera," December 1874.

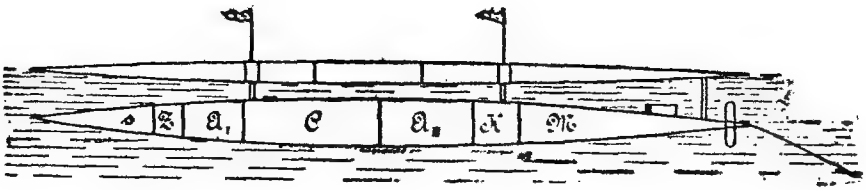


Fig. (H) The Patrick torpedo was a model submarine, like the modern types save in power source. s—explosive charge. Z—fuze mechanism. C—tank for compressed carbon dioxide. A_I and A_{II}—chemical heaters for expanding carbon dioxide. M—Motor.

plosion would be too hard to calculate properly—and even harder to accomplish—and finally he discarded the idea altogether. Instead he advocated rockets to be fired directly from launching tubes below the water line. His sketch of the proposed mechanism (Fig. C) is rather crude and his explanation somewhat confused; it is easy to see that he had not done any experimentation.

Montgéry's suggestion was revived in 1862, in an improved form, by Major Hunt of the Engineer Corps, United States Army. Major Hunt also wanted to fire rocket-propelled torpedoes from underwater launching tubes. His torpedoes (Fig. D bottom) had the shape of projectiles and consisted of a head filled with cannon powder or, possibly, guncotton, and a powerful rocket, surrounded by a wooden "shoe" which carried inclined fins or rather ridges supposed to produce rotation of the projectile. For a launching tube an 11-inch Dahlgren gun was used at first. It was soon replaced by a specially constructed 12-inch gun (Fig. D top) with two sliding valves.

The experiments were made from a submerged caisson at Red Hook, New York harbor. In order to fire the rocket, sliding valve *B* was opened first to insert the projectile. Then, after closing it again, sliding valve *C* was opened and the rocket ignited. After the rocket had left the launching tube valve *C* was closed again.

It was found that the rocket torpedoes did not stay on course very reliably but that they could be propelled for a distance of several hundred feet. This result made it ap-

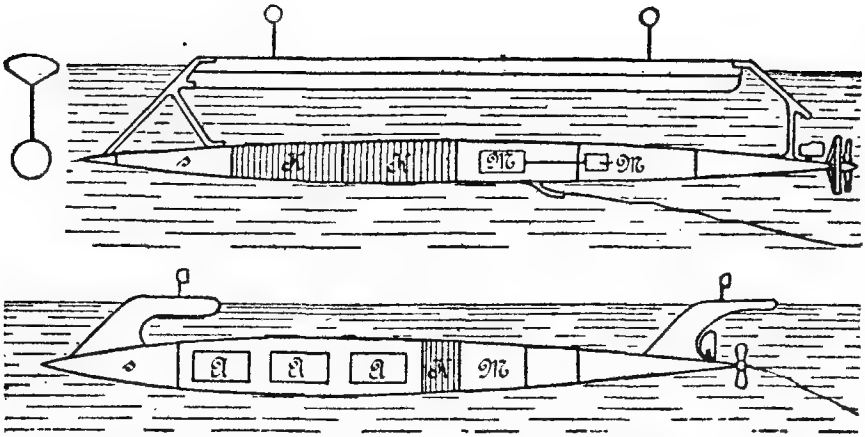


Fig. (J) Sims-Edison Torpedo—top—and Nordenfeldt Torpedo—bottom —s—explosive charge. AAA—accumulators (batteries). K—wire or cable compartment. M—motor.

pear that submerged caissons might become a valuable adjunct to shore batteries in the defense of harbors and inlets. Unfortunately Major Hunt's experiments found a tragic end. Once, after the rocket had been ignited, it was found that the outer valve had not been raised. Major Hunt feared that the gun might burst and descended into the caisson. The gun did not burst, but the major as well as an assistant who tried to come to his rescue were smothered to death in the caisson by the gases escaping around the rear valve which had probably buckled under the pressure.

But while this accident ended American experimentation with such a device it did not eliminate the idea completely.

Mr. Quick, an English engineer in the Royal Navy, somewhat later, proposed an invention on the same principle as Major Hunt's, and an experiment was recommended by the Royal Engineer Committee, which took place at Shoeburyness in 1872.

The torpedo was a cylinder, something over five feet long, with a sharp-pointed head, and immediately behind it was a space intended to be filled with guncotton. The after part of the body consisted of four rockets, which were in communication with the igniting charge, and whose gas escaped on ignition through spiral vents designed to give rotation to the rocket and keep its axis steady while projecting it through the water.

The torpedo was fired from a 10-inch gun, which was laid on the beach at about five degrees elevation, at a spot where the incoming tide would cover it to a depth of about three feet. The muzzle was closed by a disk of glass fixed in a wood washer tightly sealed round the edge, while an electric wire led through the vent of the gun to a small igniting charge in the center of the base of the torpedo. When the tide rose and covered the gun the experiment took place.

On firing, the torpedo burst open close to the muzzle of the gun, two rockets rising high into the air, one of which descended again almost immediately. . . . No further experiments have been made that I am aware of on Mr. Quick's plan. . . .

(Barber)

The explanation of this failure is simple, the glass disk was much stronger than suspected and failed to break, supported by the pressure of the water on the outside, and the torpedo broke up inside the barrel.

William Hale, the inventor of the stickless rocket for land warfare which was supposed to replace and actually did replace the Congreve rocket with its long and heavy guiding stick, is known to have been opposed to the idea of a rocket propelled torpedo. Hale pointed out that the main value of a torpedo consists in striking below the water line and in producing an underwater explosion. But this condition, he said, cannot be fulfilled in the case of a rocket-driven torpedo since the rocket, due to the steady combustion of the propelling charge, is losing weight steadily.

At about the same time when the British Navy made the single ill-fated experiment with Mr. Quick's rocket torpedo, an American engineer, who is only identified as "Mr. Phillips of Indiana," submitted a novel design for a rocket torpedo which was supposed to circumvent the difficulty pointed out by Hale. Phillips' rocket torpedo was really a torepdo-towing rocket. (Fig. E) The exceptionally large rocket, six-seven feet long and one foot in diameter, was to float at the surface, towing the comparatively small and generally cigar-shaped torpedo under water. "When the rocket strikes the enemy it explodes at the water's edge—carrying a separate bursting charge of its own—while the torpedo dives and is carried by its momentum under the ship where it explodes on striking the bottom." It seems that Mr. Phillips' rocket torpedo was never built and tested. This is more than a little deplorable, it would have been interesting to see whether the double explosion would have taken place in the manner predicted by the inventor. It would also have been interesting to see whether such a large rocket could have skimmed across choppy waves without being deflected.

In 1873 the British Navy also experimented with a rocket torpedo invented by Charles Meade Ramus. The first experiments were not very successful but the inventor did not give up and improved his device greatly so that he could demonstrate it with much better success in 1879. According to the now defunct German military magazine *Archiv für die Offiziere der Ingenieur und Genietruppe* (vol. 85) the torpedo traveled fifteen feet below the surface with a speed of about fifty feet per second. Its range was about one thousand yards. The bursting charge consisted of guncotton, the torpedo also carried a device for cutting anti-torpedo nets. Ramus' offer was rejected again, however, because a range of one thousand yards was deemed insufficient.

Returning to America we find two rocket torpedoes in 1874. One (Fig. F) was submitted in January of that year to the Bureau of Ordnance by one Mr. Weir, a civil engineer then living in New York City. Beginning at the right-hand end of the diagram we find the exhaust nozzle labeled D. It was equipped with three vanes to provide rotation around the longitudinal axis. C is the propelling charge of the rocket, EE denotes empty space supposed to fill up with sea water at the same rate at which the rocket composition is consumed. BB is a wooden sabot for fairing, A is the bursting charge and dd a tube filled with fulminate of mercury. When the rocket torpedo strikes the tube dd is jammed into the rocket composition. Even if the fulminate should fail to explode the fire from the rocket composition would gain access to the explosive charge and set it off.

This torpedo did not exist on paper only, several specimens had been built by the inventor who stated that the over-all length would be seven feet seven inches, the diameter one foot. The rocket composition was to weigh seventy-eight pounds, the explosive charge in the head seventy-four pounds, the over-all weight was to be about two hundred forty-five pounds. During privately undertaken tests such torpedoes had been fired under water, four feet below the surface and aimed at a line painted four feet below the surface on a target sixty-three feet distant. The torpedoes struck the target after four and a half seconds, five to seven inches below the four-foot line at which they had been aimed.

Almost simultaneously with the Weir torpedo the Bureau of Ordnance received another rocket torpedo project, drawn up by the Lieutenant Barber mentioned earlier. It is shown in (Fig. G). Its length was to be seven feet, the diameter twelve inches, the displacement weight two hundred eighty-seven pounds. The rocket charge was to weigh fifty-one pounds, the bursting charge forty-eight pounds.

The proposed construction of this torpedo was especially interesting and ingenious. In the center there was to be the tube holding the rocket composition. Around it a light and preferably square metal tube was to be wound spirally, its capacity being such that it could hold fifty-two pounds of water when completely filled. The water which, of course, was to replace the weight of the rocket composition was to enter in front. The torpedo was to rotate around its longitudinal axis, rotation being brought about by the shape of the outer wooden cover. This rotation would cause centrifugal force and Lieutenant Barber counted on that to distribute the water properly.

While the rotary motion would keep the water at the outer wall of the spiral tube, the spiral shape, on the other hand, would tend to make it flow toward the rear. That way the water would not only replace the weight of the consumed rocket composition, but would also locate

itself approximately where the composition had been consumed and at the proper rate. This, at least, was the theory. The ignition of the explosive charge was to be brought about by a percussion fuze. But the last portion of the rocket charge was to ignite the explosive charge at any event so that the torpedoes would blow up and not endanger friendly vessels.

It may be remarked here that the German Navy resumed experiments with powder rockets as torpedoes at the comparatively late date of 1906 and continued them for several years, until 1912 or 1913. The diameter of the rockets is said to have been eighty millimeters, nothing about their arrangement or the total size of the torpedo was ever released. But it was stated that the speed was much higher than that of the standard German Schwartzkopff torpedo—the German modification of the Whitehead, a punning fate saw to it that the name of that firm, when translated, means "blackhead" —of that year and that their cost exceeded ten percent of the cost of a Schwartzkopff only slightly. The experiments were broken off because the German designers did not succeed in making their rocket torpedoes less erratic than they were.

Mechanical and Electrical Rivals of the Whitehead

Some of these rocket torpedoes were older than the Whitehead, being attempts to provide a naval mine with motive power by means of the rocket principle, one of the three prime movers known at that time. (The others were steam engine and clockwork.)

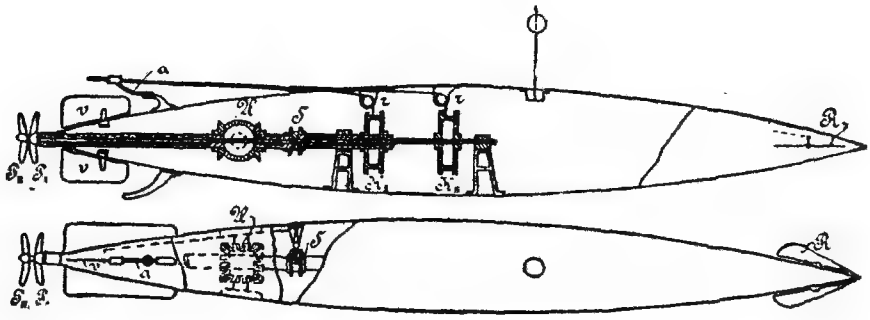


Fig. (K) Brennan torpedo. P_I and P_{II} propellers. v—vanes. K_I and K_{II}—wire drums. a—guide for the wires.

After Whitehead had shown that it could be done, other types of rivals sprang up. One of the earliest of them was the Ericsson Dirigible Torpedo, constructed in 1873. It was made of boiler plate and weighed about two thousand pounds. Its engine operated on compressed air. The torpedo was launched from above the water line and submerged by means of two inclined planes. A simple mechanism changed the angle of these planes or depth rudders when the predetermined depth had been attained. The torpedo could be steered from the shore, the compressed air required for propelling and steering the torpedo was delivered through a trailing hose which was only eight hundred feet long, limiting the range to that distance. The air was compressed by means of a hand-operated air compressor which required a dozen men to work it. But with twelve men sweating ashore to move the torpedo, it still made less speed than any of these men could have produced in a brisk walk, without running or sweating. Its maximum sped was three knots, almost incredibly slow.

The Ericsson was the only type where it was ever tried to furnish the torpedo with "fuel," other than electricity, while in motion. It did work, but that is all that can be said about it. Even if it had performed better it could hardly have been used from board of a vessel of any kind, its only value would have been harbor defense.

Many of the early types were conceived and designed with this purpose in mind. And because of that many designers did something which to us looks like the height of foolishness: they provided devices

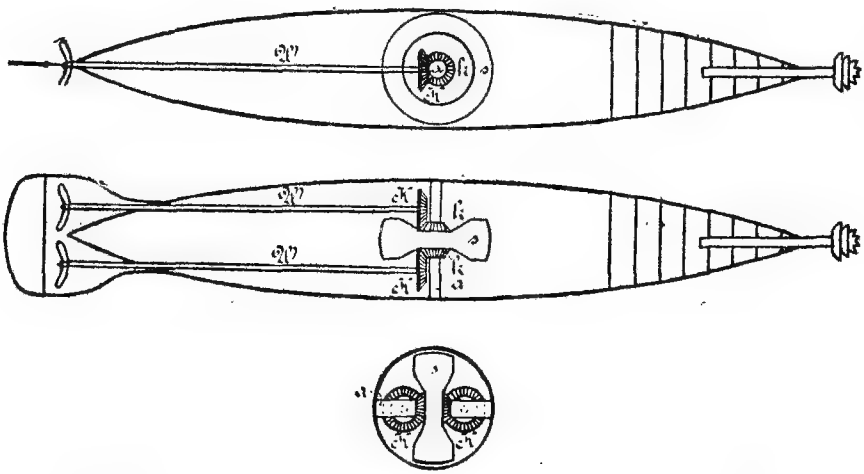


Fig. (L) Howell Torpedo. s—flywheel. KK and kk—gears. WW—propeller shafts.

to see the torpedo at all times during its journey, they even provided electric lights to show its position at night!

The torpedoes of this kind may be called float torpedoes, the names are Nordenfeldt, Sims-Edison and Patrick. While differing otherwise, all three were non-buoyant, being heavier than water and suspended from surface floats carrying small flags or brightly colored balls on upright struts; for night duty the balls were replaced by electric lamps. Even a floatless "fish" type, Brennan, was equipped with an upright strut carrying a red ball by day and a 16-Watt light bulb by night.

The Patrick torpedo (Fig. H) was propelled by liquid carbon dioxide under high pressure (C) warmed by two special heaters (A_I and A_{II}) utilizing chemical heat. The explosive charge was carried in the extreme tip (s), the fuze mechanism (Z) responded to contact as well as to electric ignition from the shore, transmitted through wires trailing behind. These wires also served to steer the torpedo. The Patrick torpedo had a competitor named Victoria, it lacked a surface float and operated on compressed air used straight, without any heating or other devices. One may also say that the Victoria was a simplified Whitehead with remote control by means of trailing wires which, of course, reduced its effectiveness instead of improving it.

The Sims-Edison torpedo (Fig. J top) and the Nordenfeldt torpedo (Fig. J bottom) were both electrical, differing mainly as regards to the source of the current. In the Nordenfeldt the motor M received its current from storage batteries (AAA). The trailing wires, reeled out of their compartment K served for steering only. As in the case of the Ericsson torpedo it can be said that it worked.

Edison was of the opinion that the trailing wires, since they existed, might as well be used for extra duty and made them carry the current in addition to steering impulses. Having thus gained extra space in the torpedo—by elimination of the storage batteries—Edison could provide much longer trailing cables, increasing the range of his torpedo. Naturally it was also much faster than the Nordenfeldt, since the motor could work on outside current.

But there was a drawback to that, too. The current which Edison fed to the motor by means of a single insulated cable and through the ground and water complicated operations. It was so powerful that the service crews had to wear rubber boots and rubber gloves to prevent accidents, and when the torpedo was tested military police had to shush visitors and onlookers away each time, not so much for reasons of secrecy but to keep the accident rate down.

The float of the Edison was constructed of sheet copper and was taken to shape the suspension and the float in such a manner that the torpedo could negotiate obstacles like anti-torpedo booms by diving under them. The upright struts of

the balls were hinged for this reason so that they would fold back in such a case. Folding back they compressed the leaf spring that held them upright and which rightened them again.

One should think that everybody had enough of trailing wires and cables by then, but in the eighties the British Government adopted another wire-trailing type for coastal defense.

Its inventor was a watchmaker by the name of Brennan living in Melbourne, Australia. Having found a to him satisfactory and at any event novel and ingenious solution of the propulsion problem, Brennan approached the British Admiralty which, in 1880, directed a higher naval officer of the Australian station to report on the merits of "Mr. Brennan's invention." Rear admiral J. C. Wilson—then only Commodore Wilson—must have reported very favorably, because Brennan was paid very considerable amounts of money for his invention and the British Admiralty developed it energetically.

In general appearance and in some particulars the Brennan torpedo resembled the Whitehead very much. It had the same shape, the same arrangement of two propellers rotating in opposite directions and it had a depth setting gear which differed from that of the contemporary Whiteheads only in minor detail. The charge was carried in the nose and consisted of guncotton. It weighed, in the final model, some two hundred pounds.

The novel invention was the way

PARTS OF DOC SAVAGE'S BODY RECOVERED!

Without warning trouble lands on Doc Savage in London—he is grabbed and whisked aboard a mystery plane.

Then the plane crashes, and Doc is among the dead. The identification is official.

But what did this have to do with the desperate search for a Czech in a concentration camp? And why was it so important to rescue the Czech? Don't miss THE SHAPE OF TERROR in the August

DOC SAVAGE

AT ALL NEWSSTANDS

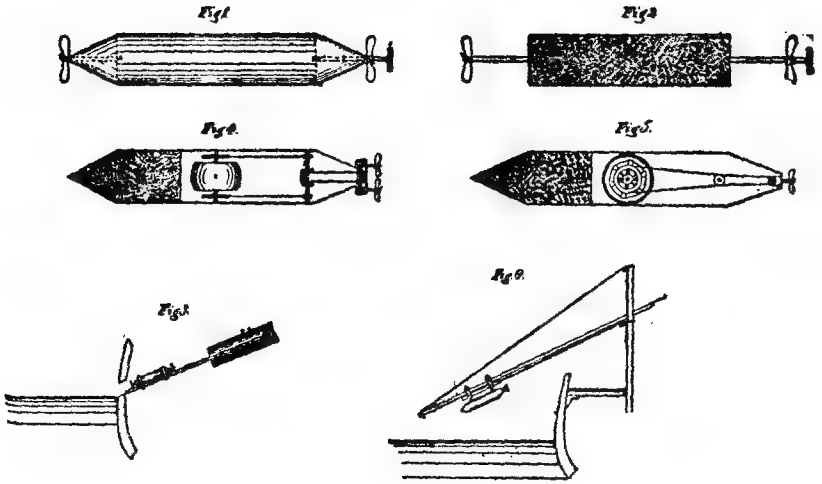


Fig. (M) Early Howell Torpedo. No. 1 and 2. original idea (not built). No. 4 and 5. diagram of the first model actually built. No. 3. original concept of launching mechanism. No. 6. first launching mechanism actually built.

in which the torpedo was supplied with power. The source was a 100 HP steam engine ashore. The torpedo carried two drums (Fig. K) upon which nine thousand feet of strong piano wire were wound tightly. These two drums were connected with the drive shafts of the propellers. The piano wires, emerging from the torpedo, were threaded through a guide (a) and attached to two cable drums ashore, the latter being connected with the steam engine.

When the steam engine turned these drums the wires were unwound from the drums inside the torpedo, making the propellers turn rapidly. If the torpedo was immersed in water, it naturally moved because its propellers turned. This led to the mildly curious result that the torpedo ran away the faster the harder the steam engine pulled the wires.

The Brennan had a considerable range and could develop a high speed—to a certain extent at the expense of range—furthermore it could be steered from the shore simply by turning the two cable drums at different speeds. The maximum deviation possible was forty degrees of arc to either side.

While the Brennan was the most ingenious of all the early rivals of the Whitehead, the American Howell torpedo was the most serious among these rivals and hardly less ingenious, although in a different manner, than the Brennan.

Fig. L shows a diagram of the final shape of the Howell, while Fig. M illustrates the development of the idea.

The inventor, Commander J. A. Howell, U. S. N., submitted the original idea to the Bureau of Ordnance on June 18, 1870. It was patented on November 21, 1871. Its essential feature was that it lacked a prime mover in the usual sense of the word. Instead it was propelled by stored mechanical energy, by a momentum engine.

Commander Howell's original conception of his torpedo is shown in Fig. M, No. 1 and 2. It was to consist essentially of nothing but an explosive charge, packed tightly into a cylindrical container. The container was rigidly connected with two shafts, each carrying a small propeller. The rear shaft, projecting for a few inches beyond its propeller, ended in the center of a cogwheel. The whole was to be incased in a thin outer shell, cylindrical in shape with conical ends to reduce water resistance. The cylindrical part of that outer shell was to be about four feet long, the diameter one foot. The torpedo was then to be placed into an inclined launching tube (Fig. M, No. 3) which had an attachment gripping the rear cogwheel. By means of this attachment the cogwheel and with it both propellers and the heavy cylinder with the explosive charge were to be rotated rapidly until a considerable amount of energy had been stored. Then the torpedo was to be released.

This form, however, was not actually built. Nos. 4, 5, and 6 on Fig. M show the actual construction of the first model and the method of launching it.

In this model the explosive charge was packed in the nose of the torpedo. The center was occupied by an iron flywheel (X) which had been made by drilling a hole through a solid iron sphere weighing a hundred pounds. A simple gear transmitted the motion of the flywheel to two propellers which were now both placed at the rear end, one rotating clockwise and the other counter-clockwise. The propellers, as can be seen in the diagram, were placed side by side like ship's propellers. The whole torpedo was slightly buoyant since it was to be retrieved after each experiment.

During tests 2000 r.p.m. were imparted to the flywheel, the torpedo was released immediately when this number of revolutions was reached. It moved in a straight line as long as it remained under water which was for any distance between thirty and one hundred feet. Then it came to the surface and continued for another one hundred or two hundred feet at the surface, but no longer in a straight line. It veered either to the right or to the left, without showing any special preference for either direction. The tests were first made from the shore at Newport, Rhode Island, and then repeated from board of the U. S. S. *Nina,* with the ship first lying at anchor and then making five knots of speed.

The performance was the same in either case.

Though these tests were mildly disappointing the design was considered as showing promise and larger models were constructed. The type built in 1890 had an overall length of one hundred twenty-eight inches, a diameter of fourteen point two inches and a total weight of four hundred seventy-five pounds. The high-explosive charge (guncotton) weighed one hundred pounds and the drop-forged steel flywheel one hundred thirty-one point four pounds. The propellers were geared to the flywheel in such a manner that each made eight hundred revolutions to one thousand revolutions of the flywheel. The flywheel was rotated at the rate of 10,000 r.p.m. by means of an engine which formed a permanent attachment of the launching tube. The torpedo consisted of four distinct sections: the nose with firing pin and firing mechanism, the head with the high-explosive charge, the main section with the flywheel and the stern section with the diving mechanism.

The main advantage of the improved Howell was the simplicity of construction and its pronounced tendency to maintain its direction which was the result of the gyroscopic action of the heavy flywheel. Because of its inherent simplicity it was also much less expensive than a Whitehead.

But some of the advantage of simplification had been accomplished only by removing it from the torpedo and putting it on the launching tube. While it is conceivable that a Howell might be wound up by an airplane engine in a torpedo plane and used from the air, it could not be done with the same lack of mechanical complications as is the case with the Whitehead. And although the flywheel could store an energy of about one hundred fifty thousand meter/kilograms, a most remarkable figure, the range of the Howell remained comparatively short, mostly because it had the tendency of losing speed rather quickly.

The main disadvantage, however, was that the Howell could not be kept ready for immediate action for an indefinite length of time. Neither would it have been feasible to keep the flywheel still and then crank it up very fast; feeding a Whitehead into a launching tube would be faster under any circumstances. And that is the reason why the more complicated and more expensive Whitehead finally won out, even over the simple and inexpensive Howell.

THE END.

Huddling Place

by CLIFFORD D. SIMAK

A sequel to "City," this story suggests a new point of human psychology—one that may, in truth, become important in such a culture as Simak proposes. A man can't leave his home!

Illustrated by Williams

The drizzle sifted from the leaden skies, like smoke drifting through the bare-branched trees. It softened the hedges and hazed the outlines of the buildings and blotted out the distance. It glinted on the metallic skins of the silent robots and silvered the shoulders of the three humans listening to the intonations of the black-garbed man, who read from the book cupped between his hands.

"For I am the Resurrection and the Life—"

The moss-mellowed graven figure that reared above the door of the crypt seemed straining upward, every crystal of its yearning body reaching toward something that no one else could see. Straining, as it

had strained since that day of long ago when men had chipped it from the granite to adorn the family tomb with a symbolism that had pleased the first John J. Webster in the last years he held of life.

"And whosoever liveth and believeth in Me—"

Jerome A. Webster felt his son's fingers tighten on his arm, heard the muffled sobbing of his mother, saw the lines of robots standing rigid, heads bowed in respect to the master they had served. The master who now was going home—to the final home of all.

Numbly, Jerome A. Webster wondered if they understood—if they understood life and death—if they understood what it meant that Nelson F. Webster lay there in the casket, that a man with a book intoned words above him.

Nelson F. Webster, fourth of the line of Websters who had lived on these acres, had lived and died here, scarcely leaving, and now was going to his final rest in that place the first of them had prepared for the rest of them—for that long line of shadowy descendants who would live here and cherish the things and the ways and the life that the first John J. Webster had established.

Jerome A. Webster felt his jaw muscles tighten, felt a little tremor run across his body. For a moment his eyes burned and the casket blurred in his sight and the words the man in black was saying were one with the wind that whispered in the pines standing sentinel for the dead. Within his brain remembrance marched—remembrance of a gray-haired man stalking the hills and fields, sniffing the breeze of an early morning, standing, legs braced, before the flaring fireplace with a glass of brandy in his hand.

Pride—the pride of land and life, and the humility and greatness that quiet living breeds within a man. Contentment of casual leisure and surety of purpose. Independence of assured security, comfort of familiar surroundings, freedom of broad acres.

Thomas Webster was joggling his elbow. "Father," he was whispering. "Father."

The service was over. The black-garbed man had closed his book. Six robots stepped forward, lifted the casket.

Slowly the three followed the casket into the crypt, stood silently as the robots slid it into its receptacle, closed the tiny door and affixed the plate that read:

NELSON F. WEBSTER
2034-2117

That was all. Just the name and dates. And that, Jerome A. Webster found himself thinking, was enough. There was nothing else that needed to be there. That was all those others had. The ones that called the family roll—starting with William Stevens, 1920-1999. Gramp Stevens, they had called him, Webster remembered. Father of the wife of that first John J. Webster, who was here himself—1951-2020. And after him his son, Charles F. Webster, 1980-2060. And his son, John J. II, 2004-2086. Webster

could remember John J. II—a grandfather who had slept beside the fire with his pipe hanging from his mouth, eternally threatening to set his whiskers aflame.

Webster's eyes strayed to another plate. Mary Webster, the mother of the boy here at his side. And yet not a boy. He kept forgetting that Thomas was twenty now, in a week or so would be leaving for Mars, even as in his younger days he, too, had gone to Mars.

All here together, he told himself. The Websters and their wives and children. Here in death together as they had lived together, sleeping in the pride and security of bronze and marble with the pines outside and the symbolic figure above the age-greened door.

The robots were waiting, standing silently, their task fulfilled.

His mother looked at him.

"You're head of the family now, my son," she told him.

He reached out and hugged her close against his side. Head of the family—what was left of it. Just the three of them now. His mother and his son. And his son would be leaving soon, going out to Mars. But he would come back. Come back with a wife, perhaps, and the family would go on. The family wouldn't stay at three. Most of the big house wouldn't stay closed off, as it now was closed off. There had been a time when it had rung with the life of a dozen units of the family, living in their separate apartments under one big roof. That time, he knew would come again.

The three of them turned and left the crypt, took the path back to the house, looming like a huge gray shadow in the mist.

A fire blazed in the hearth and the book lay upon his desk. Jerome A. Webster reached out and picked it up, read the title once again:

"Martian Physiology, With Especial Reference to the Brain" by Jerome A. Webster, M.D.

Thick and authoritative—the work of a lifetime. Standing almost alone in its field. Based upon the data gathered during those five plague years on Mars—years when he had labored almost day and night with his fellow colleagues of the World Committee's medical commission, dispatched on an errand of mercy to the neighboring planet.

A tap sounded on the door.

"Come in," he called.

The door opened and a robot glided in.

"Your whiskey, sir."

"Thank you, Jenkins," Webster said.

"The minister, sir," said Jenkins, "has left."

"Oh, yes. I presume that you took care of him."

"I did, sir. Gave him the usual fee and offered him a drink. He refused the drink."

"That was a social error," Webster told him. "Ministers don't drink."

"I'm sorry, sir. I didn't know. He asked me to ask you to come to church sometime."

"Eh?"

"I told him, sir, that you never

went anywhere."

"That was quite right, Jenkins," said Webster. "None of us ever go anywhere."

Jenkins headed for the door, stopped before he got there, turned around. "If I may say so, sir, that was a touching service at the crypt. Your father was a fine human, the finest ever was. The robots were saying the service was very fitting. Dignified like, sir. He would have liked it had he known."

"My father," said Webster, "would be even more pleased to hear you say that, Jenkins."

"Thank you, sir," said Jenkins, and went out.

Webster sat with the whiskey and the book and fire—felt the comfort of the well-known room close in about him, felt the refuge that was in it.

This was home. It had been home for the Websters since that day when the first John J. had come here and built the first unit of the sprawling house. John J. had chosen it because it had a trout stream, or so he always said. But it was something more than that. It must have been, Webster told himself, something more than that.

Or perhaps, at first, it had only been the trout stream. The trout stream and the trees and meadows, the rocky ridge where the mist drifted in each morning from the river. Maybe the rest of it had grown, grown gradually through the years, through years of family association until the very soil was soaked with something that approached but wasn't quite, tradition. Something that made each tree, each rock, each foot of soil a Webster tree or rock or piece of soil. It all belonged.

John J., the first John J., had come after the breakup of the cities, after men had forsaken, once and for all, the twentieth century huddling places, had broken free of the tribal instinct to stick together in one cave or in one clearing against a common foe or a common fear. An instinct that had become outmoded, for there were no fears or foes. Man revolting against the herd instinct economic and social conditions had impressed upon him in ages past. A new security and a new sufficiency had made it possible to break away.

The trend had started back in the twentieth century, more than two hundred years before, when men moved to country homes to get fresh air and elbow room and a graciousness in life that communal existence, in its strictest sense, never had given them.

And here was the end result. A quiet living. A peace that could only come with good things. The sort of life that men had yearned for years to have. A manorial existence, based on old family homes and leisurely acres, with atomics supplying power and robots in place of serfs.

Webster smiled at the fireplace with its blazing wood. That was an anachronism, but a good one—something that Man had brought forward from the caves. Useless, because atomic heating was better—but more pleasant. One couldn't

sit and watch atomics and dream and build castles in the flames.

Even the crypt out there, where they had put his father that afternoon. That was family, too. All of a piece with the rest of it. The somber pride and leisured life and peace. In the old days the dead were buried in vast plots all together, stranger cheek by jowl with stranger—

He never goes anywhere.

That is what Jenkins had told the minister.

And that was right. For what need was there to go anywhere? It all was here. By simply twirling a dial one could talk face to face with anyone one wished, could go, by sense, if not in body, anywhere one wished. Could attend the theater or hear a concert or browse in a library halfway around the world. Could transact any business one might need to transact without rising from one's chair.

Webster reached out his hand and drank the whiskey, then swung to the dialed machine beside his desk.

He spun dials from memory without resorting to the log. He knew where he was going.

His finger flipped a toggle and the room melted away—or seemed to melt. There was left the chair within which he sat, part of the desk, part of the machine itself and that was all.

The chair was on a hillside swept with golden grass and dotted with scraggly, wind-twisted trees, a hillside that straggled down to a lake nestling in the grip of purple mountain spurs. The spurs, darkened in long streaks with the bluish-green of distant pine, climbed in staggering stairs, melting into the blue-tinged snow-capped peaks that reared beyond and above them in jagged saw-toothed outline.

The wind talked harshly in the

crouching trees and ripped the long grass in sudden gusts. The last rays of the sun struck fire from the distant peaks.

Solitude and grandeur, the long sweep of tumbled land, the cuddled lake, the knifelike shadows on the far-off ranges.

Webster sat easily in his chair, eyes squinting at the peaks.

A voice said almost at his shoulder: "May I come in?"

A soft, sibilant voice, wholly unhuman. But one that Webster knew.

He nodded his head. "By all means, Juwain."

He turned slightly and saw the elaborate crouching pedestal, the furry, soft-eyed figure of the Martian squatting on it. Other alien furniture loomed indistinctly beyond the pedestal, half guessed furniture from that dwelling out on Mars.

The Martian flipped a furry hand toward the mountain range.

"You love this," he said. "You can understand it. And I can understand how you understand it, but to me there is more terror than beauty in it. It is something we could never have on Mars."

Webster reached out a hand, but the Martian stopped him.

"Leave it on," he said. "I know why you came here. I would not have come at a time like this except I thought perhaps an old friend—"

"It is kind of you," said Webster. "I am glad that you have come."

"Your father," said Juwain, "was a great man. I remember how you used to talk to me of him, those years you spent on Mars. You said then you would come back sometime. Why is it you've never come?"

"Why," said Webster, "I just never—"

"Do not tell me," said the Martian. "I already know."

"My son," said Webster, "is going to Mars in a few days. I shall have him call on you."

"That would be a pleasure," said Juwain. "I shall be expecting him."

He stirred uneasily on the crouching pedestal. "Perhaps he carries on tradition."

"No," said Webster. "He is studying engineering. He never cared for surgery."

"He has a right," observed the Martian, "to follow the life that he has chosen. Still, one might be permitted to wish."

"One could," Webster agreed. "But that is over and done with. Perhaps he will be a great engineer. Space structure. Talks of ships out to the stars."

"Perhaps," suggested Juwain, "your family has done enough for medical science. You and your father—"

"And his father," said Webster, "before him."

"Your book," declared Juwain, "has put Mars in debt to you. It may focus more attention on Martian specialization. My people do not make good doctors. They have no background for it. Queer how the minds of races run. Queer that Mars never thought of medicine—literally never thought of it. Re-

placed it with a cult of fatalism. While even in your early history, when men still lived in caves—"

"There are many things," said Webster, "that you thought of and we didn't. Things we wonder now how we ever missed. Abilities that you developed and we do not have. Take your own specialty, philosophy. But different than ours. A science, while ours never was more than fumbling. An orderly, logical development of philosophy, workable, practical, applicable, an actual tool."

Juwain started to speak, hesitated, then went ahead. "I am near to something, something that may be new and startling. Something that will be a tool for you humans as well as the Martians. I've worked on it for years, starting with certain mental concepts that first were suggested to me with arrival of the Earthmen. I have said nothing, for I could not be sure."

"And now," suggested Webster, "you are sure."

"Not quite," said Juwain. "Not positive. But almost."

They sat in silence, watching the mountains and the lake. A bird came and sat in one of the scraggly trees and sang. Dark clouds piled up behind the mountain ranges and the snow-tipped peaks stood out like graven stone. The sun sank in a welter of crimson, hushed finally to the glow of a fire burned low.

A tap sounded from a door and Webster stirred in his chair, suddenly brought back to the reality of the study, of the chair beneath him.

Juwain was gone. The old philosopher had come and sat an hour of contemplation with his friend and then had quietly slipped away.

The rap came again.

Webster leaned forward, snapped the toggle and the mountains vanished, the room became a room again. Dusk filtered through the high windows and the fire was a rosy flicker in the ashes.

"Come in," said Webster.

Jenkins opened the door. "Dinner is served, sir," he said.

"Thank you," said Webster. He rose slowly from the chair.

"Your place, sir," said Jenkins, "is laid at the head of the table."

"Ah, yes," said Webster. "Thank you, Jenkins. Thank you very much, for reminding me."

Webster stood on the broad ramp of the space field and watched the shape that dwindled in the sky, dwindled with faint flickering

points of red lancing through the wintry sunlight.

For long minutes after the shape was gone he stood there, hands gripping the railing in front of him, eyes still staring up into the steel-like blue.

His lips moved and they said: "Good-by, son"; but there was no sound.

Slowly he came alive to his surroundings. Knew that people moved about the ramp, saw that the landing field seemed to stretch interminably to the far horizon, dotted here and there with humpbacked things that were waiting spaceships. Scooting tractors worked near one hangar, clearing away the last of the snowfall of the night before.

Webster shivered and thought that it was queer, for the noonday sun was warm. And shivered again.

Slowly he turned away from the railing and headed for the administration building. And for one brain-wrenching moment he felt a sudden fear—an unreasonable and embarrassing fear of that stretch of concrete that formed the ramp. A fear that left him shaking mentally as he drove his feet toward the waiting door.

A man walked toward him, briefcase swinging in his hand and Webster, eying him, wished fervently that the man would not speak to him.

The man did not speak, passed him with scarcely a glance and Webster felt relief.

It he were back home, Webster told himself, he would have finished lunch, would now be ready to lie down for his midday nap. The fire would be blazing on the hearth and the flicker of the flames would be reflected from the andirons. Jenkins would bring him a liqueur and would say a word or two—inconsequential conversation.

He hurried toward the door, quickening his step, anxious to get away from the bare-cold expanse of the massive ramp.

Funny how he had felt about Thomas. Natural, of course, that he should have hated to see him go. But entirely unnatural that he should, in those last few minutes, find such horror welling up within him. Horror of the trip through space, horror of the alien land of Mars—although Mars was scarcely alien any longer. For more than a century now Earthmen had known it, had fought it, lived with it, some of them had even grown to love it.

But it had only been utter will power that had prevented him, in those last few seconds before the ship had taken off, from running out into the field, shrieking for Thomas to come back, shrieking for him not to go.

And that, of course, never would have done. It would have been exhibitionism, disgraceful and humiliating—the sort of a thing a Webster could not do.

After all, he told himself, a trip to Mars was no great adventure, not any longer. There had been a day when it had been, but that day was gone forever. He, himself, in his earlier days had made a trip

to Mars, had stayed there for five long years. That had been—he gasped when he thought of it—that had been almost thirty years ago.

The babble and hum of the lobby hit him in the face as the robot attendant opened the door for him, and in that babble ran a vein of something that was almost terror. For a moment he hesitated, then stepped inside. The door closed softly behind him.

He stayed close to the one wall to keep out of people's way, headed for a chair in one corner. He sat down and huddled back, forcing his body deep into the cushions, watching the milling humanity that seethed out in the room.

Shrill people, hurrying people, people with strange, unneighborly faces. Strangers—every one of them. Not a face he knew. People going places. Heading out for the planets. Anxious to be off. Worried about last details. Rushing here and there.

Out of the crowd loomed a familiar face. Webster hunched forward.

"Jenkins!" he shouted, and then was sorry for the shout, although no one seemed to notice.

The robot moved toward him, stood before him.

"Tell Raymond," said Webster, "that I must return immediately. Tell him to bring the 'copter in front at once."

"I am sorry, sir," said Jenkins, "but we cannot leave at once. The mechanics found a flaw in the atomics chamber. They are installing a new one. It will take several hours."

"Surely," said Webster, impatiently, "that could wait until some other time."

"The mechanic said not, sir," Jenkins told him. "It might go at any minute. The entire charge of power—"

"Yes, yes," agreed Webster, "I suppose so."

He fidgeted with his hat. "I just remembered," he said, "something I must do. Something that must be done at once. I must get home. I can't wait several hours."

He hitched forward to the edge of the chair, eyes staring at the milling crowd.

Faces—faces—

"Perhaps you could televise," suggested Jenkins. "One of the robots might be able to do it. There is a booth—"

"Wait, Jenkins," said Webster. He hesitated a moment. "There is nothing to do back home. Nothing at all. But I must get there. I can't stay here. If I have to, I'll go crazy. I was frightened out there on the ramp. I'm bewildered and confused here. I have a feeling—a strange, terrible feeling. Jenkins, I—"

"I understand, sir," said Jenkins. "Your father had it, too."

Webster gasped. "My father?"

"Yes, sir, that is why he never went anywhere. He was about your age, sir, when he found it out. He tried to make a trip to Europe and he couldn't. He got halfway there and turned back. He had a name for it."

Webster sat in stricken silence.

"A name for it," he finally said. "Of course there's a name for it. My father had it. My grandfather—did he have it, too?"

"I wouldn't know that, sir," said Jenkins. "I wasn't created until after your grandfather was an elderly man. But he may have. He never went anywhere, either."

"You understand, then," said Webster. "You know how it is. I feel like I'm going to be sick—physically ill. See if you can charter a 'copter—anything, just so we get home."

"Yes, sir," said Jenkins.

He started off and Webster called him back.

"Jenkins, does anyone else know about this? Anyone—"

"No, sir," said Jenkins. "Your father never mentioned it and I felt, somehow, that he wouldn't wish me to."

"Thank you, Jenkins," said Webster.

Webster huddled back into his chair again, felt desolate and alone and misplaced. Alone in a humming lobby that pulsed with life—a loneliness that tore at him, that left him limp and weak.

Homesickness. Downright, shameful homesickness, he told himself. Something that boys are supposed to feel when they first leave home, when they first go out to meet the world.

There was a fancy word for it—agoraphobia, the morbid dread of being in the midst of open spaces—from the Greek root for the fear—literally, of the market place.

If he crossed the room to the television booth, he could put in a call, talk with his mother or one of the robots—or better yet, just sit and look at the place until Jenkins came for him.

He started to rise, then sank back in the chair again. It was no dice. Just talking to someone or looking in on the place wasn't being there. He couldn't smell the pines in the wintry air, or hear familiar snow crunch on the walk beneath his feet or reach out a hand and touch one of the massive oaks that grew along the path. He couldn't feel the heat of the fire or sense the sure, deft touch of belonging, of being one with a tract of ground and the things upon it.

And yet—perhaps it would help. Not much, maybe, but some. He started to rise from the chair again and froze. The few short steps to the booth held terror, a terrible, overwhelming terror. If he crossed them, he would have to run. Run to escape the watching eyes, the unfamiliar sounds, the agonizing nearness of strange faces.

Abruptly he sat down.

A woman's shrill voice cut across the lobby and he shrank away from it. He felt terrible. He felt like hell. He wished Jenkins would hurry up.

The first breath of spring came through the window, filled the study with the promise of melting snows, of coming leaves and flowers, of north-bound wedges of waterfowl streaming through the blue, of trout that lurked in pools waiting for the fly.

Webster lifted his eyes from the sheaf of papers on his desk, sniffed the breeze, felt the cool whisper of it on his cheek. His hand reached out for the brandy glass and found it empty, put it back.

He bent back above the papers once again, picked up a pencil and crossed out a word.

Critically, he read the final paragraphs:

The fact that the two hundred fifty men who were invited to visit me, presumably on missions of more than ordinary importance, only three were able to come, does not necessarily prove that all but those three are victims of agoraphobia. Some may have had legitimate reasons for being unable to accept my invitation. But it does indicate a growing unwillingness for men living under the mode of Earth existence set up following the break up of the cities to move from familiar places, a deepening instinct to stay among the scenes and possessions which in their mind have become associated with contentment and graciousness of life.

What the result of such a trend will be, no one can clearly indicate since it applies to only a small portion of Earth's population. Among the larger families economic pressure forces some of the sons to seek their fortunes either in other parts of the Earth or on one of the other planets. Many others deliberately seek adventure and opportunity in space while still others become associated with professions or trades which make a sedentary existence impossible.

He flipped the page over, went on to the last one.

It was a good paper, he knew, but it could not be published, not just yet. Perhaps after he had died. No one, so far as he could determine, had ever so much as realized the trend, had taken as matter of course the fact that men seldom left their homes. Why, after all, should they leave their homes?

Certain dangers may be recognized in—

The televisor muttered at his elbow and he reached out to flip the toggle.

The room faded and he was face to face with a man who sat behind a desk, almost as if he sat on the opposite side of Webster's desk. A gray-haired man with sad eyes behind heavy lenses, eyes that were filled with the sadness and humility of having looked on death and misery, compassionate eyes.

For a moment Webster stared, memory tugging at him.

"Could it be—" he asked and the man smiled gravely.

"I have changed," he said. "So have you. My name is Clayborne. Remember? The Martian medical commission—"

"Clayborne! I'd often thought of you. You stayed on Mars."

Clayborne nodded. "I've read your book, doctor. It is a real contribution. I've often thought one should be written, wanted to myself, but I didn't have the time. Just as well I didn't. You did a better job. Especially on the brain."

"The Martian brain," Webster told him, "always intrigued me. Certain peculiarities. I'm afraid I spent more of those five years taking notes on it than I should have. There was other work to do."

"A good thing you did," said Clayborne. "That's why I'm calling you now. I have a patient—a brain operation. Only you can handle it."

Webster gasped, his hands trembling. "You'll bring him here?"

Clayborne shook his head. "He cannot be moved. You know him, I believe. Juwain, the philosopher."

"Juwain!" said Webster. "He's one of my best friends. We talked together just a couple of days ago."

"The attack was sudden," said Clayborne. "He's been asking for you."

Webster was silent and cold—cold with a chill that crept upon him from some unguessed place. Cold that sent perspiration out upon his forehead, that knotted his fists.

"If you start immediately," said Clayborne, "you can be here on time. I've already arranged with the World Committee to have a ship at your disposal instantly. The utmost speed is necessary."

"But," said Webster, "but . . . I cannot come."

"You can't come!"

"It's impossible," said Webster. "I doubt in any case that I am needed. Surely, you yourself—"

"I can't," said Clayborne. "No one can but you. No one else has the knowledge. You hold Juwain's life in your hands. If you come, he lives. If you don't, he dies."

"I can't go into space," said Webster.

"Anyone can go in space," snapped Clayborne. "It's not like it used to be. Conditioning of any sort desired is available."

"But you don't understand," pleaded Webster. "You—"

"No, I don't," said Clayborne. "Frankly, I don't. That anyone should refuse to save the life of his friend—"

The two men stared at one another for a long moment, neither speaking.

"I shall tell the committee to send the ship straight to your home," said Clayborne finally. "I hope by that time you will see your way clear to come."

Clayborne faded and the wall came into view again—the wall and books, the fireplace and the paintings, the well-loved furniture, the

promise of spring that came through the window.

Webster sat frozen in his chair, staring at the wall in front of him. Juwain, the furry, wrinkled face, the sibilant whisper, the friendliness and understanding that was his. Juwain, grasping the stuff that dreams are made of and shaping them into logic, into rules of life and conduct. Juwain using philosophy as a tool, as a science, as a stepping stone to better living.

Webster dropped his face into his hands and fought the agony that welled up within him.

Clayborne had not understood. One could not expect him to understand since there was no way for him to know. And even knowing, would he understand? Even he, Webster, would not have understood it in someone else until he had discovered it in himself—the terrible fear of leaving his own fire, his own land, his own possessions, the little symbolisms that he had erected. And yet, not he, himself, alone, but those other Websters as well. Starting with the first John J. Men and women who had set up a cult of life, a tradition of behavior.

He, Jerome A. Webster, had gone to Mars when he was a young man, and had not felt or suspected the psychological poison that ran through his veins. Even as Thomas a few months ago had gone to Mars. But twenty-five years of quiet life here in the retreat that the Websters called a home had brought it forth, had developed it without him even knowing it.

HE NEEDS 81 TONS OF SUPPLIES A MONTH TO WIN HIS FIGHT...

WHAT ARE YOU DOING TO HELP?

AMAZING BUT TRUE—

It takes 81 tons of supplies a month to keep a soldier overseas. That's a large order . . . and it's got to be filled!

Huge quantities of paper are needed for this . . . for arms containers, for targets, food cartons, U. S. Army Field Ration "K", and many other things.

That's why the government is asking YOU to help that boy overseas by collecting every scrap of waste paper you can. Get your friends to pitch in . . . form groups . . . interest your whole neighborhood in this drive. Paper is vital to the winning of the war . . . and to prevent a disastrous shortage . . .

GET IN THERE . . .
SAVE WASTE PAPER
TO SAVE THEIR LIVES!

There had, in fact, been no opportunity to know it.

It was clear how it had developed—clear as crystal now. Habit and mental pattern and a happiness association with certain things—things that had no actual value in themselves, but had been assigned a value, a definite, concrete value by one family through five generations.

No wonder other places seemed alien, no wonder other horizons held a hint of horror in their sweep.

And there was nothing one could do about it—nothing, that is, unless one cut down every tree and burned the house and changed the course of waterways. Even that might not do it—even that—

The televisor purred and Webster lifted his head from his hands, reached out and thumbed the tumbler.

The room became a flare of white, but there was no image. A voice said: "Secret call. Secret call."

Webster slid back a panel in the machine, spun a pair of dials, heard the hum of power surge into a screen that blocked out the room.

"Secrecy established," he said.

The white flare snapped out and a man sat across the desk from him. A man he had seen many times before in televised addresses, in his daily paper.

Henderson, president of the World Committee.

"I have had a call from Clayborne," said Henderson.

Webster nodded without speaking.

"He tells me you refuse to go to Mars."

"I have not refused," said Webster. "When Clayborne cut off the question was left open. I had told him it was impossible for me to go, but he had rejected that, did not seem to understand."

"Webster, you must go," snapped Henderson. "You are the only man with the necessary knowledge of the Martian brain to perform this operation. If it were a simple operation, perhaps someone else could do it. But not one such as this."

"That may be true," said Webster, "but—"

"It's not just a question of saving a life," said Henderson. "Even the life of so distinguished a personage as Juwain. It involves even more than that. Juwain is a friend of yours. Perhaps he hinted of something he has found."

"Yes," said Webster. "Yes, he did. A new concept of philosophy."

"A concept," declared Henderson, "that we cannot do without. A concept that will remake the solar system, that will put mankind ahead a hundred thousand years in the space of two generations. A new direction of purpose that will aim toward a goal we heretofore had not suspected, had not even known existed. A brand new truth, you see. One that never before had occurred to anyone."

Webster's hands gripped the edge of the desk until his knuckles stood out white.

"If Juwain dies," said Hender-

son, "that concept dies with him. May be lost forever."

"I'll try," said Webster. "I'll try—"

Henderson's eyes were hard. "Is that the best that you can do?"

"That is the best," said Webster.

"But, man, you must have a reason! Some explanation."

"None," said Webster, "that I would care to give."

Deliberately he reached out and flipped up the switch.

Webster sat at the desk and held his hands in front of him, staring at them. Hands that had skill, held knowledge. Hands that could save a life if he could get them to Mars. Hands that could save for the solar system, for mankind, for the Martians an idea—a new idea—that would advance them a hundred thousand years in the next two generations.

But hands chained by a phobia that grew out of this quiet life. Decadence—a strangely beautiful—and deadly—decadence.

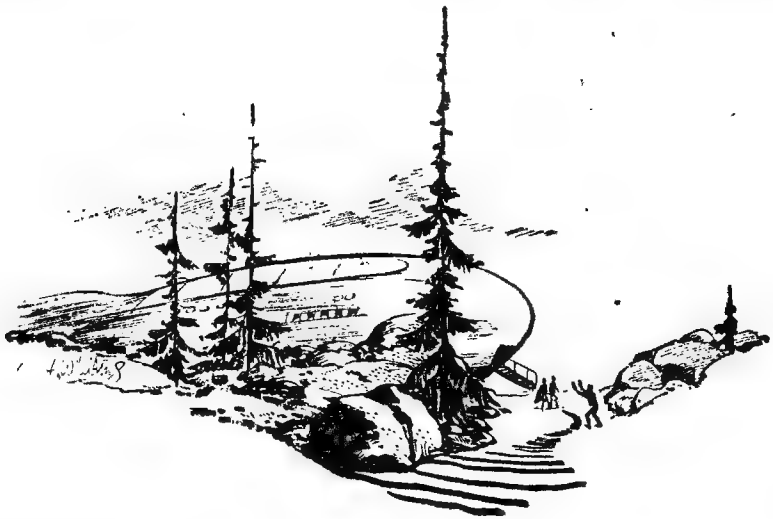
Man had forsaken the teeming cities, the huddling places, two hundred years ago. He had done with the old foes and the ancient fears that kept him around the common campfire, had left behind the hobgoblins that had walked with him from the caves.

And yet—and yet—

Here was another huddling place. Not a huddling place for one's body, but one's mind. A psychological campfire that still held a man within the circle of its light.

Still, Webster knew, he must leave that fire. As the men had done with the cities two centuries before, he must walk off and leave it. And he must not look back.

He had to go to Mars—or at least start for Mars. There was no



question there, at all. He had to go.

Whether he would survive the trip, whether he could perform the operation once he had arrived, he did not know. He wondered vaguely, whether agoraphobia could be fatal. In its most exaggerated form, he supposed it could.

He reached out a hand to ring, then hesitated. No use having Jenkins pack. He would do it himself —something to keep him busy until the ship arrived.

From the top shelf of the wardrobe in the bedroom, he took down a bag and saw that it was dusty. He blew on it, but the dust still clung. It had been there for too many years.

As he packed, the room argued with him, talked in that mute tongue with which inanimate but familiar things may converse with a man.

"You can't go," said the room. "You can't go off and leave me."

And Webster argued back, half pleading, half explanatory. "I have to go. Can't you understand. It's a friend, an old friend. I will be coming back."

Packing done, Webster returned to the study, slumped into his chair.

He must go and yet he couldn't go. But when the ship arrived, when the time had come, he knew that he would walk out of the house and toward the waiting ship.

He steeled his mind to that, tried to set it in a rigid pattern, tried to blank out everything but the thought that he was leaving.

Things in the room intruded on his brain, as if they were part of a conspiracy to keep him there. Things that he saw as if he were seeing them for the first time. Old, remembered things that suddenly were new. The chronometer that showed both Earthian and Martian time, the days of the month, the phases of the moon. The picture of his dead wife on the desk. The trophy he had won at prep school. The framed short snorter bill that had cost him ten bucks on his trip to Mars.

He stared at them, half unwilling at first, then eagerly, storing up the memory of them in his brain. Seeing them as separate components of a room he had accepted all these years as a finished whole, never realizing what a multitude of things went to make it up.

Dusk was falling, the dusk of early spring, a dusk that smelled of early pussy willows.

The ship should have arrived long ago. He caught himself listening for it, even as he realized that he would not hear it. A ship, driven by atomic motors, was silent except when it gathered speed. Landing and taking off, it floated like thistledown, with not a murmur in it.

It would be here soon. It would have to be here soon or he could never go. Much longer to wait, he knew, and his high-keyed resolution would crumble like a mound of dust in beating rain. Not much longer could he hold his purpose against the pleading of the room, against the flicker of the fire, against the murmur of the land where five generations of Websters had lived and died.

He shut his eyes and fought down the chill that crept across his body. He couldn't let it get him now, he told himself. He had to stick it out. When the ship arrived he still must be able to get up and walk out the door to the waiting port.

A tap came on the door.

"Come in," Webster called.

It was Jenkins, the light from the fireplace flickering on his shining metal hide.

"Had you called earlier, sir?" he asked.

Webster shook his head.

"I was afraid you might have," Jenkins explained, "and wondered why I didn't come. There was a most extraordinary occurrence, sir. Two men came with a ship and said they wanted you to go to Mars."

"They are here," said Webster. "Why didn't you call me?"

He struggled to his feet.

"I didn't think, sir," said Jenkins, "that you would want to be bothered. It was so preposterous."

Webster stiffened, felt chill fear gripping at his heart. Hands groping for the edge of the desk, he sat down in the chair, sensed the walls of the room closing in about him, a trap that would never let him go.

"I had a rather strenuous time, sir," said Jenkins. "They were so insistent that finally, much as I disliked it, I resorted to force. But I finally persuaded them you never went anywhere."

THE END.

"WITHOUT IT, HE'D BE DEAD RIGHT NOW!"

"One thing saved him. Plasma. So if he gets well, he has *you* to thank . . . Housewife Jones, Stevedore Smith, Sophomore Brown!"

And if he didn't get the plasma . . . if he didn't get well . . . would he have *you* to blame? You, who mean to go to the Red Cross blood bank, but never quite get around to it?

Don't give it a chance to happen. Go to your blood bank NOW . . . and win a soldier's undying gratitude—as well as —perhaps—his life!

THE RED CROSS NEEDS YOUR BLOOD *NOW!*

Brass Tacks

1. *E. E. Smith is too busy on the important item of the chemistry of unstable nitrogen compounds to write.*
2. *Del Rey, a friend of R. M. Williams, wrote "Though Dreamers Die" with Williams' agreement.*
3. *I'll see what can be done about smaller type for Brass Tacks.*

Dear Mr. Campbell:

First, the Analytical Lab report for March 1944.

1. "The Contract," by E. Mayne Hull: The cover story is the best in the issue. An excellent story in an excellent series.
2. "The Rulers," by A. E. van Vogt: A near classic short. This is an exception to the rule that the novelettes or serials must take the top ratings; van Vogt, one of the best authors. I look forward to his serial in the next issue. He has given ASF some of its best stories. The only example needed is "Slan!"
3. "The Children's Hour," by Lawrence O'Donnell: Excellent fantasy. In *Unknown* it probably would have received first. I give it the number three spot because of its science-fiction interest and the excellent writing it contained.
4. "Circle of Confusion," by Wesley Long: It seems to be the first in a new series, yes? I like this one but please only one more if you *must* have it. Down to specific comment on the story, that "Sandra Drake" is not even a variation of a standard character. She has been, it seems, in too many s-f stories. However, I like the idea of the "lens" and that exchange of reversal of polarity from odd to even numbered stations.
5. "Controller," by Eric Frank Russell: A very neat short.

These stories of Americans with gadgets are good, and I do mean good. More!

6. "Deadline," by Cleve Cartmill: This deserves the last spot! I usually like Cartmill's offerings, but this one, ugh! This seems to me mediocre fantasy, the kind which would rank low in *Unknown* also. This is what I fear, low-ranking fantasy in ASF. Please limit the fantasy to one story an issue, IF it must be included. (Even if it's not fantasy I don't like it.)

The cover was excellent. Timmins although poor on human faces was able to do a very nice job with the zilth's puss. The most appropriate interior drawings were those done by Williams for "The Children's Hour." The honors (?) for illustrations in this issue seem about equally divided between Orban and Williams. Could it be because they are the only artists? No, perish the thought! I make myself satisfied by thinking of after the war. Just think, Rogers and Timmins on the covers, and Rogers, Schneeman and a little by the present valiant "holders-of-the-line" in the interior. Can't you get Wesso or perhaps even Paul for anything, any time?

The article, "Vanishing Yankee," was good as the articles usually are. Orchids to Smith: good stories and good articles; maybe he can draw, too? I like those small articles that you use as fillers, not a wasted line, eh? Ye Ed's page was also up to its par—which is of course, A, number one, ipsy pipsy, Yankee Doodle, for you who listen to "Can You Top This?"

I'm happy to see that Probability Zero has been scrapped, for at least one issue. The longer this item remains absent during the condensed war-time issues the better I and many other readers will like it!

This issue all in all is of high caliber, but what I most enjoyed was "In Times To Come." When first I saw it I felt wonderful; my disposition improved 385.856%! I have wanted a serial, the next issue bears the first part of a serial by A. E. van Vogt, next only in desirability to one by E. E. Smith of Skylark and Lensman fame; I wanted a Jameson story about Bullard, the magnificent, and such is forthcoming. Who wouldn't feel wonderful? All I need to top this off would be an announcement that the Japs and the Germans had surrendered unconditionally, that's all! But, to pick up a gentle (?) hint that was was dropped two sentences ago, when will the old master of zwilnik and Lensman fame write the sequel to his last epic? By Klono's brazen hoofs, at least supply the answer to this last.

Among the curiousae of ASF: In the February 1944 issue there was a story by Lester del Rey called "Though Dreamers Die." When I read this I seemed to recall it somehow. I looked through my "files" and came up with the following. In the September 1938 issue of ASF there was a story by Robert Moore Williams called "Robots Return." This story told of the return of the descendants of the five Thoradson

robots who had been left on the planet of a distant sun, in "Though Dreamers Die." They mentioned a certain map which also appeared in the latter story. This is, of course, more than coincidence, and if it is evidence of a sort of writers' exchange of ideas, well and good, if not, it still is no skin off my nose, as I enjoy continuations and developments of stories no matter what their nature. I don't think Williams and del Rey are the same person as 1) it would serve no purpose and 2) the writing in each story seems different. Whatever the reason or explanation it is worth mentioning.

I have read in several of the letters that the bindings seem not to hold out. I am happy to state that except for the December issue, which had staples that tore the pages, my copies of ASF, including the November issue, have held up under extremely hard usage.

Now I have a suggestion which I am sure has been advanced by others; if it has been here is a vote in favor of it. The suggestion is that Brass Tacks be put in the small type that ASF used to use for it, that many other S-F magazines use for their letter columns, and that you are now using for "In Times To Come" and "The Analytical Laboratory." It really prints very nicely. It is dark and just as legible as the printing for the rest of the magazine. You remarked that the presses that are now used for ASF print very clearly, and now I see that this is so. This type, which usually seems broken and light, is very clear, so, as I have said before, how about it? Why not put it up to a vote, huh?—M. Eneman, 414 West 44th Street, New York 18, New York.

Dear Mr. Campbell:

1. "The Changeling"—swell new idea, very excellently handled.
2. "Lobby"—superb presentation of only means to a lasting peace in the ending episode.
3. "The Long Way"—I like the Venus Equilateral series.
4. The two articles are very interesting and informative.
5. "The Bureaucrat"—more than one way of skinning a cat, eh?
6. "Invariant" } These two just about tie; both good but not exceptional.
7. "Sanity"— }

Editoral informative as usual, and well presented. GOOD cover, a nice blending of colors without being blatant. Interior pics probably as good as possible considering small space available for them.—E. Everett Evans, 25 Popular Street, Battle Creek, Michigan.

★ ★ ★ ★ ★ ★ ★ ★ ★

Book Review

"ROCKETS: A Prelude to Space Travel," by Willy Ley. The Viking Press, New York City. $3.00

"Run, do not walk—" No, that won't do. Every time I get one of Willy Ley's books to review I mess around for thirty minutes trying to find synonyms for supercolossal. What I am trying to say, chum, is this: If you like science-fiction, if you really believe that there will be a next year after this one, if you think the spacesuit will eventually replace the zoot suit, this is for you, this is your dish, this is a book you have been waiting for.

If you have friends and relatives who sneer at you for reading those cheap magazines with the lurid covers with the Buck Rogers ships, keep this book around the house for emergencies. Dare them to read it. Force them to read it. This book is a clear, factual account, with strict attention to the scientific method and in accordance with the best, conservative, contemporary engineering practice, of *how* we will conquer space, reach the far side of the moon, walk the dead sea bottoms of Barsoom!

It is written by a mechanical engineer who spent several years in research and experimentation in reaction engines (rockets); it is written so that other engineers may follow each line of reasoning and judge for themselves the validity of the conclusions. But such is Willy Ley's skill in handling the English language that "Rockets" is one of that exceedingly rare sort of books, a work which is simultaneously a rigorous engineering treatise and a gripping, lucid popular account of a thoroughly romantic subject—the new adventure, the highroad to the stars!

Ley shines brightest in his ability to state in words, clear words, concepts which are ordinarily stated only in mathematical formulae. (Lin Yutang is another of the very few who can express abstruse ideas in pellucid English; note that he, like Ley, was not born to the tongue. Is it possible that we native-born never really learn to speak our own language?) In the few cases where the mathematics and

the engineering data get in the way of the story, necessary tables, formulae, and derivations are included in an appendix. You may take them or leave them alone; they are not necessary to the exposition.

Ley's basic thesis may be stated thusly: All of the basic research necessary to permit us to reach the Moon and the nearer planets by means of *passenger*-carrying *rocket* ships has already been told. What remains is routine development work, expensive and tedious, but routine and quite certain. It is the sort of job that a major American corporation would assign an engineering team to, an allotment of money, shop and laboratory facilities, then await results with a quiet assurance that the job would be done in—let's say three to five years. We could even guess at the make-up of the team. Head it up with a mechanical engineer, include a metallurgist, a chemical engineer, an explosives chemist, an electrical engineer, a radio engineer who has specialized in electronic control systems, a good structures man, civil or aeronautical, add a mathematician skilled in ballistics. Provide collaboration and advice from the rest of the engineering staff. Add junior engineers when needed. Put up two hundred thousand dollars as a starter and count on a deficiency allotment for the first—unmanned—Moon rocket.

General Electric could start the day the war is over. General Motors could make a swell try at beating them to the finish. If the Russians did not nose out both of them. How? Because the basic work is all done. We know the kind of engine, we have the fuel, we have the necessary alloys, we know all the steps; what remains is routine development and test. It would not even need the help of the great names in rocket research —Goddard, Ley, Pendray, Oberth, Parsons, et cetera. *Any* such team of engineers could do it, or should go back to digging ditches.

Furthermore, it would be done and promptly if a major corporation were convinced that it would pay off in dividends.

One of the most interesting parts of the book is concerned with a discussion of the possible economic benefits of space travel. Ley gives convincing reasons for believing that space travel will pay dividends far beyond the cost of the development. While what he surmises is almost certainly true, it is pleasant to conjecture that the real major rewards of space travel are as yet unguessed, just as Columbus did not dream of our great new continent when he sailed west for Cathay. Why not? It has been so with every great new advance; why not with space travel? One may venture to guess that the most romantic stories of planetary travel ever published in Astounding may prove to be stumbling, blind, conservative.

But Ley does show that the *immediate* results should show a profit.

The book is arranged chronologically. The first part takes up the history of the great dream. The

literature, fantastic and otherwise, is described. Attention is given to early gropings, both in theory and experimentation. A detailed account is made of the German Rocket Society, in which Ley participated, during its great days and on up until its tragic suffocation at the hands of the Nazis. Much of this is familiar to readers of Astounding.

The last half of the book discusses the matter we are really interested in: How to build spaceships and how to make them fly. The care and feeding of astronauts. What to do about meteors. How to set a course that will get you to Venus and back. How to make an approach for a landing. How much fuel, what kind, and why.

(The following note is intended only for science-fiction writers; the cash customers are requested not to read it. Better get this book and bone up. A lot of you have been getting away with faulty physics and ridiculous contradictions simply because most of your readers could not check up on you when it came to orbits, speeds, length of voyage, space maneuvering, et cetera. Willy Ley has changed all that and deserves a good sharp note from the union. But from now on you had better watch it—or you can expect to appear in some pretty embarrassing situation in Brass Tacks. Better buy a slip stick, too. It appears that at last forty percent of the readers use them.)

Despite the fact that "Rockets" covers the history and theory and immediate future of space travel in an almost encyclopedic fashion it is only a little longer than an ordinary whodunit, not as long as a Doc Smith serial. It is profusely illustrated and is a handsome volume. But the best thing about it is not that it is an enjoyable book; it is the conviction it gives that some of you who are now reading these words will, before you have time to become bald, walk the far side of the Moon, gazing on peaks never seen through a 'scope, your feet scuffing the soft pumice of Luna.

Somewhere near your elbow there will be another figure, dressed like yourself in a G.E. pressure suit with plexiglas helmet and oxygen tank.

I hope I'm in that suit.

—Robert A. Heinlein.

THE END.

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They were queer little brutes, distinguished by an uncanny ability to turn anything—even egg beaters and fountain pens!—into deadly weapons. And Space Law forbade traders to sell deadly weapons or their parts—!

Utility

by DAVID ANDERSON

Illustrated by Williams

The *Cassiopeia* had a full crew that slept aboard the night before we left for Merans. That is, it was full except for McCord, Hydrophobia McCord, and nobody was very sorry about that. Three months cooped up in the small trading ship with McCord would be plenty long. We knew. We had shipped with him before.

Rumors are absolutely false when they say that Hydrophobia McCord had never had a bath in his life. I helped give him one once on Bonsby when things got so bad that the crew ganged up and carried him outside the shed in the middle of a Bonsby winter. We had to cut through three feet of ice and it darned near killed him, but McCord got a bath. That was five years ago, of course.

Nobody I ever met could recall seeing him ever take a drink of water, but there were witnesses to that one bath. McCord was aller-

gic to water both externally and internally.

In desperation and in the middle of a huge drunk McCord had once gone to some quack psychologist who certified for ten dollars that McCord had a psychosis which made even the near presence of water an exquisite torture to McCord's sensitive nerves.

After his bargain-counter psychoanalysis, whenever anybody brought the subject up, McCord would get wells of tears in his big, baby-blue eyes and wail, "It's my psychosis, fellows, I can't help it. Don't you see it?"

On our previous trip to Merans Captain Wilkins had said, "It isn't the optic nerve that your psychosis bothers."

Which about summed it up for all of us.

The *Cassiopeia* was a rumbling little trading ship built without much concern for the crew or any passengers which might be fool enough to want a cheap ride, but she was built like a bank vault and padded with goose down in the cargo holds for the benefit of the Jewelworlds which were the chief item of cargo from Merans to Earth.

On the morning of this particular take-off Captain Wilkins was in the navigator's cabin giving us the once over and sounding out the new men aboard. Most of us had shipped with him before, more times than we cared to remember—and always with Hydrophobia McCord aboard.

Captain Wilkins opened the Spaceman's Bible that lay in front of him, a neat little pamphlet of some twenty-eight hundred pages telling what you can do and what you can't do on which planet and why.

"Trading on Merans with the Diomedes is a ticklish proposition," the captain said slowly and he thumbed through the Bible. "If there's a more ornery, cantankerous race of misbegotten protoplasm on any planet than inhabits Merans I have yet to see it."

He continued to thumb through the volume in exasperation that was slowly turning his face red and changing its shape into a thunderous scowl.

"Who's been—?"

I knew what was coming next. I had seen the same performance so many times before that I knew exactly how long he would thumb before he reached for his pocketbook.

He grumbled at the bottom of his throat. "Forgot. I carry this thing in my pocket so I can refer to it." He extracted the sheet torn from the Bible.

"Section 118-B, Paragraph 32 of the Interstellar Regulations Governing the Relationship Between Sovereign Bodies of the Various Inhabited Worlds and Regulations Concerning Property Rights Thereof. 'No trading body, corporation, company, or individual shall sell, transfer, exchange, donate or in any other manner cause to be placed in the custody or use of belligerent groups, races, individuals, or parties any weapon, tool,

mechanism, or device which may be used in warfare, conflict, or belligerent action of any nature.'

"That means that you can't even trade a club, stick, rod, or . . . There *I* go! . . . you can't trade a simple baseball bat to the Diomedes for their Jewelworlds because if you do they'll go out and start clubbing the Arthoids.

"We tried to get the Traders' Council to declare Merans outside the intent of this regulation but they've turned us down a dozen times and so I repeat for the benefit of the new members of the crew that if we swap the Diomedes anything they can use on the Arthoids we are cooked."

I looked up quickly. He sounded more serious than before. "You mean that last—?" I started to interrupt.

Captain Wilkins glowered. "I mean that last trip when we thought we had something foolproof. We traded eggbeaters, a whole cargohold full of them, for Jewelworlds. We thought we could find nothing more harmless in the world than an eggbeater to use for barter. Well, as you know, the common eggbeater uses a vibratory principle, coupled with molecular air infusion. The Diomedes are little gadget lovers and they very ingeniously hooked up twenty or thirty eggbeaters in parallel and proceeded to whip the Arthoids into a froth.

"There was hell to pay when the news of it leaked out to the Council. They threatened to cancel the license of Barter, Inc. Timothy Thorgersen, president of our outfit—in case any of you are so ignorant as not to know—threatened to take the *Cassiopeia* crew apart molecule by molecule. He forbade us ever to trade on Merans again—and six days later he ordered us back."

"Why the change?" asked Hap Paulson, our navigator. "I don't get it."

"We can thank Hydrophobia McCord—bless his smelly soul. He got the wonderful brainstorm that the one thing that the Diomedes could not turn into a weapon is the ordinary writing pen. So here we are with a hold bulging full of pens to trade to these little catastrophes of procreation."

"Why can't we just go now—and forget McCord?" It was Dunc Edwards, the chief engineer. He looked around hopefully and got a feeble nod from every one of the rest of the crew. Captain Wilkins merely looked at him without answer. No trading party to Merans had gone without McCord since the planet had first been discovered by him and Thorgersen eight years ago.

The captain shut the Bible and raised his arm to put the book in the wall locker. His arm halted in midair and he slowly turned around. His nose twitched. He looked suspiciously at each of the crew. But every man was looking askance at his neighbor.

Captain Wilkins saw nothing and turned again to put the book away. Then he whirled and sniffed violently.

"What in—?" he began.

I was getting it plenty strong. It didn't seem to come from anywhere in particular, but the condensed, filtered, and distilled essence of orchids was suddenly upon the air so thickly that it swirled visibly when you turned your head.

There was the scent of roses there, too, as if a ton of them had been pulped and the juice was slowly distilling into the air. Then with an overpowering rush there seemed to be a maelstrom of odor—every flower in the botanical catalogues seemed to be there, from floating moss to snapdragons.

We were all thinking the same thing: Someone, in anticipation of McCord's arrival, had broken a vial of dime-store perfume.

"All right, all right!" Captain Wilkins thundered. "Who brought it aboard?"

"I did. Isn't it wonderful, fellows? My psychosis won't bother you now."

"McCord!"

We all whirled to face the door as Hydrophobia McCord oozed in. "Isn't it wonderful?" he repeated. His baby-blue eyes were glowing and his nostrils oscillated appreciatively in the scented atmosphere.

"No!" roared Captain Wilkins. "In the name of all that's smelly what did you spill on you?"

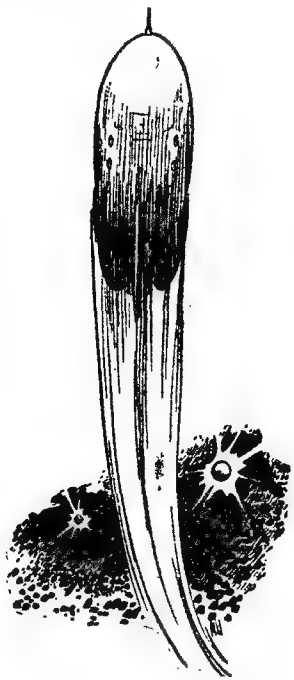
"Oh, nothing," said McCord innocently. "It's one of these newfangled midget ologenerators. See?" He held up a tiny instrument with a dial face and a couple of switches on it.

"It's small enough to go in your pocket and you can adjust to any strength or any scent you like. I've got it on full on all of them now. Thought you'd like it better that way. But I can give you anything you want. There's lilacs for example."

Instantly, the overpowering scent of all the flowers in the books disappeared and was replaced by the gentle, springy scent of lilacs. Even Captain Wilkins was mollified. To tell the truth, it wasn't half bad compared to what we had expected with McCord's appearance.

"Leave it there," Captain Wilkins grumbled. "And turn it down. Keep it just high enough to—" He jerked his head meaningly.

McCord wasn't a bad sort if you could endure the sight of his great,



bulbous form occupying the full width of a catwalk as he ambled along as if in a heavy sea like some great ship designed by a drunken naval architect. And if you didn't mind his psychosis—

A special cargo of ninety proof was aboard for McCord's own use. He swore to all creation that his psychosis wouldn't permit him to partake of any other liquid. But nobody cared particularly about that. It meant McCord would be in his bunk during most of the voyage, completely at the mercy of his psychosis.

In two respects, this voyage was like no other that we'd made with Captain Wilkins. For the first time we had an atmosphere of lilacs instead of decayed cabbage, and we knew it would be our last trip after the fabulous Jewelworlds of the Diomedes and the Arthoids unless McCord's hunch was right and the cargo of pens would prove to be a harmless medium of exchange with the creatures.

The inhabitants of Merans all seem to belong to the same genus but there are a dozen different species. Only the two, the Diomedes and the Arthoids, produce the famous Jewelworlds. The products of the Diomedes are far superior to the others which produce considerable distortion.

Barter, Inc., had made a fortune out of the Jewelworlds by holding them up to robbery prices. It's true the things are rare enough and most people have never even seen one. They are simply crystal-clear spheres anywhere from a half inch to eight inches in diameter. They have a property which causes them to respond to the minute waves of the human brain and will recreate a picture of any imagined scene in the mind of a person gazing into the sphere.

A couple of thousand treatises have been written on the Jewelworlds, but none has yet been able to figure out how they work. It has been called everything from self-hypnosis to a complicated mechanical and electrical receiver and projector for mental radiations. No one knows for sure.

The creatures of Merans make them partly out of raw materials found on the planet and, like oysters making pearls, they use secretions of their own bodies in fashioning the spheres. Unlike oysters and pearls, the Jewelworlds are made entirely outside the bodies of the creatures. They fashion them with their own furry paws.

The reason Hydrophobia McCord is so invaluable to any trading party is that he was the first human being to make contact with the Diomedes and Arthoids. Though the two species are mortal enemies, they both act as if McCord is their god.

The creatures are gadget maniacs. It's queer, but they do not have an intricate mechanical culture of their own. All they make are the Jewelworlds. But in the presence of any gadget from Earth or elsewhere they act completely off their bases.

In the matter of utility, they have

one-track minds. No matter what the gadget, they try to make a weapon out of it. It seems as if that's the only use they can conceive for anything mechanical. They tear into the most complicated televisor and put it back together again so that it will practically lay eggs—or spray a death ray. Gadgets are like drink to them.

McCord may be partly responsible for this. He and Timothy Thorgersen were the first ones to land on Merans and McCord discovered the two species making Jewelworlds. He finagled one out of them in exchange for a pocket visor. They practically worshiped him for what they seemed to think was an exchange that was robbery—of McCord.

I suppose you could build up quite a thesis on human nature that the two men, McCord and Thorgersen, were on Merans simultaneously and had exactly the same opportunity to exploit the planet. One of them snowballed that beginning into the greatest trading company operating out of the Solar System. The other one remained a drunken bum.

Even during the following years when McCord gave up his erratic and ill-managed attempts to do his own trading around the systems and became merely a cheaply paid negotiator for Barter, Inc., and other companies, he never seemed to realize his real worth in dealing with the creatures of Merans. Or rather, he seemed afraid they would decide to get along without him and he wouldn't get a chance to go back to Merans.

No one knew quite what attitude to take towards McCord. It was usually a combination of disgust and pity, with disgust the larger portion.

The *Cassiopeia,* suffused with the fumes of lilac blossoms, rose into the skies for its three months' journey which might well be the last trip to Merans if we slipped and pulled a boner like we did on the eggbeater trade.

Hydrophobia McCord seemed optimistic, however, that the pens would prove to be the solution to all the trading troubles on Merans. I wasn't so sure. There was nothing complicated about the pens. They were the ordinary type of supersonic points designed to produce a permanent record on Permosize paper, but I felt kind of leery of turning over to the Diomedes even such a simple gadget as the tiny supersonic generator contained in the barrels of the pens.

But there was no use worrying. We were on our way.

McCord himself seemed bent on making it a memorable journey. Instead of retiring to his cabin with a case of the ninety proof, he seemed to refrain entirely from liquid nourishment and wandered about the ship in jovial temperament.

You could detect him coming two levels away by the increase in lilac scent pervading the air.

The second day out, Dunc Edwards down in his chief engineer's

repair shop detected the now familiar, almost overpowering scent. He looked up from his bench where he was examining a burned-out meter as McCord waddled in.

"Hello, chief," McCord said with a friendly grin. "Mind if I come in?"

Dunc Edwards' response was a low growl in the lower regions of his throat. But McCord was used to such response and acted as if he'd been welcomed like a long-lost uncle with a fortune to share.

His bulk sidled up to the chief.

Edwards stood it as long as he could. "Will you please turn that thing down a little? What are you trying to do? Anaesthetize me?"

"Sure, sorry."

I happened to be over in the corner of the shop doing a grease monkey's job on a converter chamber that had blown out just after take-off. None of us had been able to figure out what caused it to blow and Dunc Edwards was in a boiling stew over it.

He finally turned to McCord in suppressed rage and said in tempered tones, "Will you kindly state your business as quickly as possible, Mr. McCord, and then scram?"

"Oh, yeah, sure—" McCord seemed dismayed by Edwards' abrupt manner. "I just wanted to ask you a little favor. I would like to use a bench and some of the tools in the shop during the trip. There's a little gadget I want to work on."

"*All* during the trip?"

"Most of the trip."

"Right *here* in this room?"

"Why, yes."

"I'm sorry, McCord, but I am charged with maintaining the mechanical operation of this ship and this repair shop is private domain into which no other members of the crew are allowed except by special permission of Captain Wilkins." Edwards' voice was so formal and level with fury that it hurt.

But McCord's face beamed. "Oh, I'm sure it will be all right with Cap. I'll go and see him and be right back."

Hydrophobia McCord waddled out again and up the companionway. Dunc Edwards turned to me and screwed up his face in a wink. "Wait till that walking flower pot gets to the captain. He'll get told off plenty."

Then his face sobered and he looked worried. "But just in case—"

He went to the interphone and call the captain.

Captain Wilkins wasn't in his

quarters. In growing fear and anxiety, Edwards called all over the ship. Finally he connected with the captain in the hold and told him what McCord wanted.

"If you so much as dream of letting that combination flower pot and garbage can on wheels come into this shop, I resign!"

"McCord has already seen me and I have told him it was none of my business," said Captain Wilkins, "but since that's the way you feel about it I order you to allow McCord the use of any facilities he may require to produce the gadget he contemplates. Give him the run of the shop."

Edwards' normally florid face went through shades of the spectrum like an auroral display and he hung up without another word.

He turned on me. "You heard? I should let that olfactory calamity work in here with me? I quit!"

Edwards, of course, didn't quit. He sulked in the corridors and in the game room for half a day and finally came back, glaring as he entered the doorway and saw the mountainous back of McCord hunched over a workbench.

Nobody during the entire three months saw McCord so much as touch a drop of liquid to his lips. How he got along without it, I don't know. He must have sneaked whiskey in minute quantities at night, but he never took enough to affect his locomotion. He slaved over his mysterious gadget in the repair shop and told no one what it was.

He had told Captain Wilkins that it was a device for insuring permanent trading possibilities with the Diomedes and Arthoids. That was enough for the captain to issue his orders to Edwards.

The last few days of the voyage McCord worked in a frenzy to finish. The day before we landed it was completed, so he said.

There was an apprehension among the crew, unspoken but definite. Without being a trader it's hard to understand the peculiar pride the members of this queer and sometimes grotesque profession take in their work. There's a pride in the accomplishment of meeting members of seemingly incomprehensible races and successfully putting over a barter deal.

If we failed to continue the contacts on Merans, we'd be blacklisted with every trading company in the business.

The peculiar, gadgety psychology of the Diomedes and Arthoids combined with the natural cantankerous nature of the creatures made Merans probably the most difficult trading area in existence.

No one ever has and probably never will understand what makes the little devils want to fight with every other type of life on their planet. Maybe it's just their gadgety nature that makes them turn every device that's traded to them into a weapon, but certainly they have a one-track idea of utility.

All we knew was that we were there to trade for Jewelworlds and it was against the law to trade

weapons or interfere in local warfare. .

Merans is about as desolate a world as has been encountered with life on it. Plant forms are practically nonexistent. The surface of the planet is rugged, but no mountains worthy of the name are there. There are low hills and cliffs big enough to contain caves in which the inhabitants live. And there are pools of water large enough for them to swim in, which is what they do about half the time.

The air is cold and light, but it is possible to go without spacesuits which makes trading a lot easier because all communication is by sign language. The creatures of Merans appeared to be totally voiceless and if they communicated with each other nothing was known of their methods.

Captain Wilkins set the *Cassiopeia* down on a barren plain between two mesas and beside a pool of water where the Diomedes were likely to be swimming.

The final jar as she settled on the stern plates was a welcome sound to us all. After three months in concentrated lilac soup we were all partially intoxicated or asphyxiated by it.

Dunc Edwards was the first out. He leaped like a kid and beat his hands on his chest. "Air! Pure, fresh air!" he exclaimed.

It was an act for McCord's benefit, but the latter wasn't even looking. He left the hatch slowly with a purposeful look on his face and marched straight across the plain towards the pool. Captain Wilkins nodded with a tense, satisfied look on his face. "Better break out the pens, boys. McCord's on his way to open negotiations."

With full knowledge of the crucial nature of the moment, we began hauling out the cases of writing pens to swap for Jewelworlds. The next few hours would tell us if this would be our last trip to Merans.

We had about a couple of dozen cases unloaded when Captain Wilkins pushed back his cap and shaded his eyes with his hands. "What in the name of seven constellations is that fool up to, now?"

We all looked in the direction of McCord. He was standing on the edge of the pool wigwagging frantically with his hands. It was the unique sign language he had established with the Diomedes who were frolicking in the pool.

In a moment a couple of hundred of them came tumbling up out of the water and scrambled to the bank. They sat in orderly rows as if understanding some directions McCord was giving them.

They looked like nothing more than a flock of wet teddy bears. They had long, prehensile fingers and toes that they used to fashion the Jewelworlds—and make lethal gadgets out of eggbeaters.

Then something shocked our attention and froze us rigid where we stood.

McCord was slowly peeling off his shirt. He stood a moment in the cold and we could imagine him shivering even beneath the slabs of alcoholic fat that upholstered him.

Then he divested himself of the rest of his clothes and poised a moment on the bank. His body formed an arc and he deliberately plunged into the pool.

"McCord's taking a bath!" Somebody gasped. Maybe it was all of us. We dropped the cases of pens that were in our hands and ran for the pool until the light air made our lungs burn. But we didn't stop.

Maybe McCord was committing suicide, was the thought that most of us had, I think. And without McCord we wouldn't get half the Jewelworlds we expected for our cargo of pens.

The gathering of Diomedes gave us a dirty look as we came running up as if we had no right to burst in upon their god, Hydrophobia McCord, like that.

But when we topped the rise we saw what none of us expected to see. McCord was lazily floating on his back, half submerged. He spewed a column of water, whalelike, into the air and waved.

"Hi, fellows. I knew I could do it. My psychosis is all gone now, see? I can take a bath any time I want to! My hydrophobia won't bother you no more."

There was no trading that day or the next, because as soon as we got McCord to come out of the pool and get dressed he took one backward look and collapsed cold.

I helped catch him or, rather, to break his fall. It was like a ton of beef coming down on me and it took four of us quite a little while to carry him back to the ship and get him in his bunk.

When that was done we brought the cases of pens back inside.

We didn't carry a ship's doctor because we were too small a tub for that, but I'd done a lot of first aid and was unanimously elected to take charge of the bellyaches and the drunks.

What I didn't know about medicine would supply a dozen specialists with a lifetime of knowledge, but McCord's condition seemed like a severe case of shock to me. After examining him, I called Captain Wilkins.

"There's something intensely not on the beam," I said. "There's something inside McCord that none of us have dreamed, I think."

"That stuff he drinks will preserve it for science until he dies, anyway," said Captain Wilkins. "What I want to know is when can he get out and trade again?"

"You don't get what I mean, Cap. In his head, I mean."

"Is there *anything* there?"

"Plenty, I think. Just before you came in he was out of his head and he yelled Thorgersen's name a half dozen times and then he said, 'It's boiling me, Thorgersen, it's boiling me.' After a while he started mumbling threats and then said, 'I did it, fellows. For eight years I've been trying to get up courage to take a bath and I've done it. He can't hurt me no more, and I'll get my eight years back, too."

Captain Wilkins scowled. "Sounds like he's sore at Thorgersen. Maybe we hadn't ought to let him out again. He might try to ruin the deal. Say . . . you don't suppose it's McCord that's been back of all the trouble we've had here?"

I shrugged. "How could he be? He hasn't always been the one to suggest the trade articles. He didn't suggest the eggbeaters. And he couldn't control the psychology of the Diomedes. Nope, I think this is something concerning McCord alone—McCord and maybe Thorgersen."

"Where does Thorgersen come in, I wonder?"

"They were here together the first time, remember."

"McCord was nothing but a drunken bum long before that. He probably has carried some sort of a grudge all these years because Thorgersen made a success instead of going along with a failure like McCord. But what I want to know is where this bath business comes in. No, I don't either. I want to know if it's going to be safe to let him out when he comes to, and can we trust him to deal with the Diomedes and Arthoids for us?"

I shrugged again. "It's either that or try to get as many Jewelworlds as we can by ourselves. In any event all we have to trade is the pens."

"I guess you're right." Captain Wilkins turned to go. "Let me know when he comes around."

McCord didn't come around for two days. I thought the guy was going to die. I didn't know enough or have the equipment—though I suppose Dunc Edwards could have rigged it up—to feed him intravenously. I was about to suggest Captain Wilkins try to raise a liner somewhere close enough to get to us a doctor when McCord finally roused.

He rose from the bunk with a glassy look in his eyes. The skin hung on him like a loosely draped rug after his two days' fast. He got down shakily and gripped my shoulder.

"The pool, Stevens," he said. "Help me get to it. I've got to take a bath again. Got to take a bath right now."

"Easy does it, old man," I said, trying to push him back into the bunk. It was still like trying to shove a baby elephant around.

"No. Got to take a bath, Stevens. Help me get to the pool."

I helped him. There was nothing else I could do. Hap Paulson and a couple of machinists came along, too. All McCord had on

was his shorts. He had even refused to don a shirt, and his great hulk was trembling and blue with cold. Hap was pleading with him.

"It'll kill you, McCord. You can't go in the water now!"

"Got to, fellows, or I may never be able to do it again. For eight years I've been trying to build up the courage. Now I've got it. Ask Doc here." He nudged me.

"What about it?" Hap asked.

My feelings in the matter were based on no medical knowledge whatever, but I said, "I think we ought to let him go. I've got a hunch it's going to do him more good than harm. If he gets pneumonia, we can lick that, but we can't lick what's in his head."

Hap gave me a queer look as if he'd put me and McCord in the same classification, but he made no further protest.

When we reached the top of the rise by the pool, McCord stopped and began wagging his arms about in the air until the little furry Diomedes began tumbling over each other to get out of the water. Then McCord tossed off his shorts and gave the rest of us a shove to one side. He poised, trembling, looked into the water, and stopped—

He seemed to collapse all over like a pricked balloon. We couldn't tell whether his body was trembling with cold or from the sudden great sobs that broke from him as he began to go back down the rise.

Hap and the machinists turned away. They couldn't stand the sight of a man so broken by some inexplicable fear. But I touched him on the shoulder.

"Maybe if I gave you a shove—" I suggested.

He looked up at me with his tear-filled, baby-blue eyes like an ungainly St. Bernard. His head wagged slowly. "You *know,* don't you, Stevens?"

I didn't, but I nodded anyway.

It seemed to do something to McCord. He gathered himself into a knot and then ran back up the slope with all his might. At the top he closed his eyes and grasped his nose like a kid and leaped.

The tremendous splash covered us with icy water, but we didn't duck. We looked to see what was going to happen to McCord.

For a moment it looked as if he were drowning, so violently did he thrash around. His face came up out of the water purplish as if he were struggling for air. Yet I knew he hadn't been there long enough to use a half lungful.

It wasn't lack of air. It was in his head.

Abruptly he stopped fighting the water. He struck out with a long, somewhat awkward stroke, but it was a stroke that had belonged to a once-experienced swimmer. He went around the pool once, then stopped in front of us, treading water.

"It's gone for good this time, fellows. My hydrophobia's gone for good."

When I saw Captain Wilkins next morning he was in a blue fury. I heard him raging up and down

the bridge and before I even came in I could hear McCord's name mentioned vigorously several times.

"What's wrong?" I asked.

The captain stopped long enough to eye me up and down as if I were an imbecile. "Wrong!"

Then his eyes settled on me steadily and a beatific expression came over him. "Stevens—it seems to me that McCord has taken a strange liking to you. He told me last night that you were the only one around here that understood him. Maybe you can talk to him and straighten him out."

The captain's voice was sugary and I knew it meant I'd better get some results or it would be my neck in the stocks next.

"What's he done?" I asked.

"It's what he's going to do. He insists on taking this cargo of pens that I've lugged across seventy

light-years of space and trading them to the Arthoids for their inferior grade of Jewelworlds that give enough distortion to make a man think he's drunk every time he looks into one."

"Why not the Diomedes first?"

"That's what you're going to find out."

McCord was in the bathtub when I went in. He had taken six baths during the night and had had three more before breakfast.

"What's the dope on our new trading angle?" I asked.

He dunked completely under the water and bubbled up again like a kid. "Just a new wrinkle. Going to make the Diomedes jealous and give us a better deal. I found out they could produce twice as many Jewelworlds as they do if they weren't so darn lazy."

It sounded a bit fishy. I didn't think the Diomedes had any capacity for an emotion like jealousy.

"You don't mean to trade all our pens with the Arthoids, do you?"

"No, just eight or ten cases of them ought to be enough."

"But that won't leave enough to make a decent trade with the Diomedes!"

"Sure it will. You'll see."

"I don't know whether I will or not. Captain Wilkins is about ready to go out and try to make a deal himself."

That got McCord. He went pale all over. He stood up and began to dry himself. He was shaking again though the room was warm.

"He can't do that! Stevens, you've got to help me. Say you'll do it."

"Do what? I'd like to know what the score is."

"It's awfully important to me," pleaded McCord, "and it's nothing that will hurt the traders, but we've got to work with the Arthoids first. Maybe five cases of pens will be enough to make the Diomedes jealous. Persuade the captain for me, will you?"

I had that hunch again that something tremendous—for McCord—was going on inside his skull. But I was a little dubious about his inexplicable desire to trade with the Arthoids first. That jealousy angle was phony as a glass eye.

"I'll do it," I said for no reason that I could fathom. It was a hunch and I prayed it wouldn't be a bad one.

I went back to the captain and explained the jealousy angle.

He looked at me out of one eye. "You don't believe that gag, do you?"

"Why not?" I said innocently. "Figure it out for yourself. These little gadget maniacs are craftsmen. When they see we're trading with their rivals first, they'll know something's wrong with the deal they've been giving us. Always we go to the Arthoids second and fill up with the second-rate stuff after we've got all the first grade we can get. We know about how much we can expect from the Diomedes so we reverse the procedure and get a better deal next time we come around."

"You're either a blockhead or a

liar," said Captain Wilkins. "But if he only wants to trade five cases of pens to the Arthoids we'll humor him. I'm going to see Thorgersen about this when we get back, though."

So we traded with the Arthoids first. McCord led the trading procession next day and five of us followed his regal obesity across the plain, past the pool where the Diomedes stopped to stare at us as if they coudn't believe their eyes. They knew what was going on, but McCord didn't give them a second glance.

We paraded on over to the mesa on the opposite side of the valley, where the Arthoids were poking around in their caves. Their powerful, roselike odor filled the air. The five of us stopped while McCord went ahead to palaver with his arm waving. None of us knew where he had picked it up. He wouldn't teach it to anyone else and any other traders had to get along as best they could, which wasn't very good. I once tried waving my hands around in front of a Diomede for a couple of hours and the only response I got was his turning over and going to sleep.

But it seemed as if McCord was having instant and overwhelming success. The Arthoids came tumbling out of their caves, apparently flattered by our coming to them first. Each one was juggling an armful of their second-rate Jewelworlds.

We watched McCord pick up one and look at it. He set it down and haggled some more. Finally, he called us over and we began dealing out the pens in exchange for the Jewelworlds.

I got that queer feeling in the pit of my stomach again about those pens as I saw the way the little creatures grabbed them so excitedly, made sure they could operate them and then dashed up to their holes in the cliffs again. There was something distinctly not right, but it was only a hunch again and I decided to stay shut up.

It took us quite a number of trips to bring back all the Jewelworlds we got for five cases of pens. The Arthoids refused to help. They said the Diomedes still had one bank of eggbeaters with a little power left and were waiting to catch some Arthoids at close range.

By the time the deal was over and we had trundled the loot back to the ship the day was pretty well gone. The days are several hours shorter than on Earth, anyway. We decided to wait until tomorrow before approaching the Diomedes.

McCord took some more baths. Nobody else could get in the tub because he was always there. I began to think he'd grow gills.

And the way he drank water—

I saw him drink three quarts in a row at least twice in that one day, and he had several pints in between as a sort of chaser. Once, somebody offered him a glass of beer and I thought he was going to lay the man out.

Along about suppertime, which was after dark, the commotion started.

It started as if the *Cassiopeia* were suddenly being pounded with a hail of shrapnel and a sort of unearthly squealing and yelling filled the air.

We raced to the ports and looked out after turning on the outside lights. There must have been about four or five thousand Diomedes out there throwing stones at the ship and making those little squealing noises.

"McCord!" Captain Wilkins thundered. "See what's wrong out there!"

McCord obediently got out of the bathtub and hastily donned a robe. He went out through the hatch and raised his arms above his head. The clamor stopped instantly but the little Diomedes crouched and cowered as if in intense pain. There was a lot of arm waving then between McCord and the furry creatures, then McCord slowly came up the companionway.

"Well—?" Captain Wilkins looked as if he were ready to throw McCord bodily down the stairs again.

"I guess we muffed it, captain. The Arthoids seem to be getting even for that eggbeater deal."

Captain Wilkins went white under his space tan. So did every other member of the crew present.

"You mean they've made a weapon out of those pens?"

McCord nodded.

I looked at him suspiciously. The whole business smelled as high as McCord used to, but there was nothing I could put a finger on. Who could have suspected that the Arthoids could do anything with a harmless object like a pen?

Nobody but me, and it was only a hunch.

"What have they done?" Captain Wilkins asked.

"It seems that the Diomedes have a system of communication that we have never suspected. They are like bats. They generate supersonic waves, and by means of very delicate organs they can detect those waves. The Arthoids knew that and that's why they were so glad to have the supersonic pens. They've hooked them all in phase and turned them on full power. They are slowly torturing the Diomedes to death through their sensitive hearing organs. They'll all be dead by morning unless we help them."

Captain Wilkins let out a groan that was echoed by all the rest of us. We visioned our trading careers blighted for the rest of our lives. The Council wouldn't allow any company to hire us after this boner.

"There's something else, too," said McCord.

"You couldn't possibly make it worse," said Captain Wilkins.

"I'm afraid so. I learned something else. The Jewelworlds have a property we didn't know anything about. Ordinarily, the Diomedes live several hundreds of our years, but when one of them dies all the Jewelworlds it has made cease functioning no matter where they are. That means that all the Jewelworlds we have ever brought back will be practically worthless."

Captain Wilkins was too stupefied by this news to groan any more. He merely sat down and buried his face in his hands.

Dunc Edwards looked out the port towards the far stars. "We could head out away from the Solar System as far as our fuel would take us," he suggested.

Captain Wilkins glared at him, but he was deadly serious.

And then McCord spoke again. "I have a suggestion."

Captain Wilkins' glare turned on him was permission to speak.

"The only solution is for us to exterminate the Arthoids," said McCord.

"How would you do that, even if it weren't stupid to even think of such a thing?"

"I have a method," said McCord quietly.

Every eye turned upon him. A cold wave swept over us and we all seemed to get the same idea at the same time. That gadget McCord had been working on during the trip —his insistence on trading with the Arthoids first.

"Why, you—" I spluttered.

"You planned this!" Captain Wilkins thundered.

"Captain!" McCord's voice was full of hurt and he averted his eyes.

I don't quite know yet what saved McCord from being slaughtered right there in the ship in the next fifteen minutes. Captain Wilkins swore, the men of the crew tried to grab McCord but he beat them off with a heavy metal chair and when our rage had exhausted us, he said quietly, "I suggest you call Timothy Thorgersen and get permission to exterminate the Arthoids. It can be done in such a way that it will appear that the Diomedes have done it without any help from us."

All this time the clamor outside had been going on again. The Diomedes peppered the ship with rocks and kept up their high-pitched squealing that we didn't even know they could make before, pleading for our help.

"It's the only way," said McCord.

Slowly, Captain Wilkins turned around to the communication panel and put in a call for Timothy Thorgersen. Every man in the room knew that it was the end of his trading career and there was murder in their eyes as they glowered at McCord.

It took a while to get Thorgersen on the beam. He was out partying somewhere as usual and his face was flushed and angry as he came in view. "What is the meaning of this interruption, captain?" he snapped.

Briefly, Captain Wilkins explained the situation and the solution as given by McCord.

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On the color screen we could see the blood rush to Thorgersen's head and the little veins in his forehead swelled and pulsed. "McCord!" he spat. "Put him on!"

Captain Wilkins beckoned to McCord who seemed as calm as a spring morning as he walked between the threatening crew members towards the thunderous image of Thorgersen.

"Yes?" said McCord.

"McCord, what's the meaning of this? Isn't there some way out besides what Wilkins says you suggest?"

"None at all, Mr. Thorgersen. There is something else you should know, too: I took a bath."

Thorgersen seemed to go pale on the screen, but he blustered, "Your personal pathologies are nothing to me."

"You know what I mean," said McCord evenly and there was a tone in his voice that we had never heard before. "I took a bath."

"I want to know what this is all about!"

"I'll take care of this situation on Merans so that you will never have to worry about your supply of Jewelworlds again. You will be able to get all you want."

"Go ahead," said Thorgersen. "Slaughter the whole bunch of Arthoids if necessary as long as Barter, Inc. is not connected with it."

"There are certain concessions that I want," said McCord, "before I save your precious Diomedes. I want my share of the profits from the Jewelworlds which you have robbed me of during the last eight years. I want a return of my share in the trading company we formed. In exchange for this I'll save your main asset of Barter, Inc. and forget that you tried to murder me."

Thorgersen sputtered with incipient apoplexy, but before he could speak, McCord went on again. "All the agreements I want you to sign are in the hands of my lawyers along with the murder charge that will be released if you fail to comply. There are about five hundred witnesses to your attempted murder and they are all living."

"You're crazy! You can't threaten—"

"I can and am. The Diomedes are intelligent creatures, and now that I can speak vocally with them their testimony will be admitted in any court. I'll keep the Arthoids from killing the five hundred I need until they can testify against you. Better call my lawyers and make up your mind fast. I'll give you a half hour."

McCord gave the name of his law firm and clicked off.

The rest of us stared open-mouthed at McCord, the changed McCord. He had browbeat the one man we all feared because of the arbitrary control he exercised over us.

But now McCord seemed to sag as if some great energy had gone out of him and he sank down on a chair.

"What are you trying to do?" asked Captain Wilkins. "You can't blackmail Thorgersen. That's sui-

cide to try to pull a stunt like that on him."

"It's not blackmail," said McCord in a tired voice. "It's merely an attempt at justice. When Thorgersen and I landed on this planet eight years ago we had a joint interest in the trading company that we had formed.

"Sure, I had a reputation then of being a drunken bum and not caring about anything. I admit it. I was young and didn't have a brain in my head, I guess. Thorgersen was older and more settled. He took this trading business seriously and I was in for the fun of it. He was determined to roll the thing into a big corporation with great fleets of trading ships like he finally got. But that seemed too much like business red tape to me. I would have been content with a half dozen ships and a bottle of good whiskey on Saturday nights. Thorgersen saw me as just an anchor to him.

"Then I found the Jewelworlds here on Merans and saw their possibilities. I knew they'd be worth a fortune if we exploited them right. Thorgersen admitted I had a good idea, so good that he tried to murder me in order that he wouldn't have to share the profits with me.

"I celebrated the discovery of the Jewelworlds with an extra quart and while I was half cockeyed Thorgersen tapped me on the head and threw me in the pool out there where the Diomedes swim. That's what gave me my psychosis."

Dunc Edwards snorted. "You aren't going to try to tell us that you actually had a hydrophobia that

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kept you away from water!"

"I'm telling you," said McCord evenly. "The Diomedes fished me out and brought me around. That was when I worked out a sign language with them and they became so friendly because I showed them how my pocket visor worked. The little devils took it apart and made a death ray out of it that they turned on the Arthoids until the power ran out. I later gave one to the Arthoids to get in solid with them.

"Thorgersen kept trying to hang around and get a load of Jewelworlds, but I told the Diomedes not to give him any. When I finally confronted him, he thought he was seeing a ghost, but when he found out about my psychosis he thought I was crazy and that it would be safe enough to take me back, which I bargained for by getting some of the Jewelworlds for him.

"For eight years I've been trying to get up courage to go back into that pool where he tried to drown me. I knew it was the only thing that would cure me, and that if I didn't make it this trip I never would. So I made arrangements before we left to bargain with Thorgersen for what he stole from me."

Captain Wilkins was about to break in when the gong sounded and Thorgersen was back. His apoplectic face was pale now and his jowls sagged. "I've signed," he said. "You see that you take care of your end. Come in and see me when you get back."

He cut off without giving McCord a chance to speak. McCord checked with his lawyers and found that Thorgersen had kicked through. He had complied in every detail.

McCord rose then and gathered into himself some of the new energy he seemed to possess.

"Damned clever," Captain Wilkins muttered. "I've never seen a deal put over like that before."

"You think I'm lying?" McCord said.

"Sure. I don't care how drunk you were or how hard you were hit. Merely being thrown in a pool wouldn't give you a psychosis for the rest of your life that would make you afraid to drink a glass of water."

"There were five hundred Diomedes swimming in the pool at the time," said McCord patiently. "They were responsible for it indirectly."

"What's that got to do with it?"

"Have you ever seen the demonstration where supersonic waves are set up in an oil bath by a crystal vibrating at such frequencies being immersed in the bath?"

"I've heard of such."

"You stick your finger in the oil and it will nearly burn it off. Remember?"

"Sure, but—"

"There were five hundred Diomedes in that pool, some under the surface, some swimming on top. They were chattering and gossiping their heads off—at supersonic frequencies. It was like being thrown in a vat of boiling oil. The hundreds of frequencies beat together and produced waves that hammered

and tore at me and others that burned. It didn't bother the Diomedes, of course. They're built for it. But I thought I was being boiled alive.

"The Diomedes fished me out of there, but from then on every time I saw so much as a glass of water I felt that burning and tearing energy again. I couldn't help it. It would drive me crazy to hear water dripping from a tap even. I could only drink something I knew was not water, and whiskey nearly finished the job it had begun.

"I knew I had to get back into that pool without the Diomedes in it. Nothing else would cure me, but it took eight years to get courage enough to do it."

No one spoke when McCord was through. No one had a moment's doubt now of the truth of his story. He spoke simply and with the ingratiating honesty that he had always tried to project through his drunkenness though the knowledge of what others thought of him must have been torture.

He went out of the room and after a moment we followed silently behind him.

He stepped out of the hatch and we all caught the overpowering smell of the ologenerator going full blast again. We wondered why in the world he had that thing on again.

But there was an obvious change in the Diomedes now. They rose from their cowering attitude and flocked around him worshipfully.

We saw the little gadget in his hand which he had built during the trip out. It was connected with a little microphone at his lips. We knew now what it was: A device for speaking and listening to the supersonic voice frequencies of the Diomedes. The creatures were quiet, listening to him and when he finished they trooped past him in single file and he handed out several dozen ologenerators which we didn't even know he had. When they were all gone he left us and crossed the dark plain to the holes of the Arthoids in the cliffs opposite. An hour later he was back.

"What's the score?" asked Captain Wilkins finally.

"There's a truce," said McCord. "It's an armed truce, but I don't think it will ever be broken. The Arthoids have got the supersonic pens to annoy the Diomedes' hearing organs, and the Diomedes have got the ologenerators."

"What good are they?" asked Dunc.

"Haven't you ever noticed the smell around the Arthoids' caves? Like roses and orchids? The Arthoids communicate too—by means of a sense of smell, using their olfactory organs. The ologenerators will raise the merry devil with them if the Diomedes turn them on. But each side knows better now than to turn on its weapons. If it does, retaliation will be quick. I had to go over and make the Arthoids understand that. They're sore, but very agreeable."

"Won't these things kill the creatures?" I asked.

"Of course not! The Diomedes and Arthoids are my friends!"

McCord turned his wide, blue eyes on me in that hurt expression again. "The pens and the ologenerators are annoying as the devil to them, but they won't harm them."

"How could you talk to the Diomedes even if you could use supersonics? You hadn't learned their vocal language," I said.

McCord shook his head. "I wasn't sure I could, and don't ask me how. Their heads are like Jewel-worlds. Any language creates the pictures it was meant to convey and their words do the same to me. No abstractions, of course, but we managed."

We felt better now. All but Captain Wilkins. He sat in his chair as morose as ever. I asked what the trouble was.

He looked up. "Do you think Thorgersen is going to take this lying down? He may be a crook and a murderer and McCord may be safe enough from him, but look what he'll do to us! He'll take it all out on us as soon as we get back. I think we might as well resign and find a new trade right now."

McCord brightened. "Oh, you don't need to worry about that, Captain. Didn't I tell you? The transfer of the ownership of the *Cassiopeia* was one item of my conditions that Thorgersen signed. You fellows all work for me now."

He looked around hopefully at the ring of men. "I hope you don't mind, fellows," he said.

Wide grins gave him his answer. Anybody that could come out on top of a deal with Thorgersen was a good man.

"I think we should celebrate now," McCord said. He leaned towards an audio panel on the wall and called the galley. "Send up a couple of dozen quarts right away!"

There was a moment's pause as he listened, then he exploded in indignation.

"No!" he roared. "Water!"

THE END.

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